
THE THAMES

J. C. Bridgewater, Printer, South Molton Street, London.

A PLAN

FOR THE

BETTER SECURITY OF VESSELS

NAVIGATING THE RIVER THAMES.

WITH

Appendices

ON NAUTICAL SUBJECTS RESULTING THEREFROM.

By CHARLES HENRY ACKERLEY, Esq.

Lieutenant in the Royal Navy.

Inventor of the Metallic Rod (affixed to the extremities of Boats) for the Preservation of Seamen, when employed in the Whale Fishery.

"INCIDIT IN SCYLLAM, CUPIENS VITARE CHARYBDIM."

London:

LONGMAN, REES, ORME, BROWN, GREEN, & LONGMAN,

ST. PAUL'S CHURCHYARD.

A LA HAYE:
Chez J. FRANK, Libraire pour la Littérature Etrangère.

A PARIS:
Chez G. BENNIS, No. 55, Rue Neuve, St. Augustin.

1834.

ERRATA.

APPENDIX, *page* xiv, *line* 3,—*for* geometrical, *read* trigonometrical.

.... *p.* xx, *l.* 25,—*for* accéllérées, *read* accéllérée.

.... " *l.* 29,—*for* La première bateau, *read* Le premier bateau.

.... *p.* xxi, *l.* 6,—*for* arrêtées, *read* arrêtée.

.... " *l.* 17,—*for* à que j'ai l'honneur, *read* à qui j'ai.

.... *p.* xxii, *l.* 14,—*for* d'une ligne directe, *read* en ligne directe.

Preliminary.

TO THE

RIGHT HONORABLE THE LORD MAYOR

OF LONDON,

RESPECTING THE PLAN PROPOSED.

My Lord.—Having had the honor to transmit my Plan to your Lordship's predecessor, for increasing the "Security to the Navigation of the River Thames"—in reply to which, the Navigation Committee having expressed doubts as to the efficacy of their adoption, in consequence of the objections of the "Watermen" and "Lightermen"—I feel it incumbent upon me to offer for your Lordship's consideration a clearer representation of facts, of which the verbal statement alone, made by me before the Committee, could not impress sufficient conviction: and to solicit that your Lordship, as Conservator of the River, will sanction the ameliorations suggested.

As an Act of Parliament has been brought forward to improve the approaches to London Bridge* by land, your Lordship

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* Presented by Alderman Wood, M.P.

may probably think it a convenient opportunity to introduce a clause, enforcing the projected improvement of the navigation through that, and the other bridges. Or, as another Act is in contemplation, to enable another bridge to be built across the Thames, your Lordship may suggest that, as a better opportunity for adopting the plan proposed.

Convinced that every person will feel that the cause which I am now advocating is a public benefit, I beg leave to lay before your Lordship and the Court of Aldermen, as well as the Representatives of the City in Parliament, the whole correspondence relative to this improvement, which, independently of the humanity of the idea, supplies the desideratum, now existing, of that security which is of the greatest importance to the commercial community, over whose interests your Lordship and the Municipal Court preside.

The Substance of a Letter addressed to the Secretary of the Lord Mayor, dated the 9th of July, 1833.

Sir.—Practical utility, resulting from professional experience, has been the motive that has actuated me since I was honored with a commission in His Majesty's navy; and, as the subject of this letter has reference to the jurisdiction of the Honorable Court to whom you are Secretary, I have to solicit that you will be kind enough to lay before the Right Hon. the Lord Mayor in Council, the purport of this communication, which, with the utmost deference, has for its object an improvement, as simple as it is practicable, for the better security of persons and their property in vessels navigating the river Thames.

The idea of addressing you, Sir, originated from the casual circumstance of having been on board a steam boat on the 5th ult. after dark, in hazy weather, and there observing the difficulty and attendant danger to vessels, such as steamers, in "shooting" through the navigable arches of the various bridges under a great impetus; which, in addition to the falling tide, if impeded suddenly, would in all human probability terminate in a dreadful catastrophe, independently of the damage which the bridge would sustain from such a shock.

The subject may not appear to you, Sir, of sufficient importance to merit the detail I am about to enter into, regarding "*Lamps*" as mere ornaments, and not of utility; but I trust, that on mature consideration, it may not be deemed unworthy the investigation of a nautical observer, nor beneath the attention of the merchants of London. However, Sir, in order that I might be thoroughly acquainted with my subject, I have considered it a point of duty to the honorable body I am addressing, to visit expressly the objects separately alluded to in this letter. I therefore most respectfully beg you may be pleased to represent to the Right Hon. the Lord Mayor and Corporation *my suggestion*, that the gas conducted along the bridges within their jurisdiction may be made available for the better security of the navigation of the river Thames, viz.

1st.—That two branch-pipes from the main duct on the bridges should convey sufficient Gas for two good lights, to be placed above high water-mark, on each side of the navigable arch of the following bridges: *Kew* and *Putney*, their centre arches; *Battersea*, fifth arch on the north shore; *Vauxhall*, fourth arch on the east shore; *Westminster* fourth arch on the east shore; *Waterloo*, second arch on the north shore; *Blackfriars*, fourth arch on

the south shore; *Southwark*, the centre arch; and *London* bridge, the second on the north shore.

2nd.—That a centre pipe on each side of the bridge, placed vertically above the key-stone, should conduct Gas for a light of sufficient dimensions to direct the eye of the helmsman in guiding his vessel with a greater degree of precision than can be effected without a lamp.

Upon the utility of the centre light on each side of the navigable arch, I will take the liberty of expatiating. Steamers are obliged to lower their funnels, as other vessels do their masts and sails, before passing some of the bridges alluded to; the action of which, in lowering on a dark night and in tempestuous weather, intercepts the view of the helmsman, and what particularly struck me, (when at the helm of the steamer in question, progressing with a velocity of "five knots,") as being liable to cause the most experienced "to yaw," or deviate from his intended course; whereas a light at such an elevation would obviate the remotest chance of erring, with common professional skill, in passing with rapidity the centre narrow arches of the "Fulham" and "Battersea" bridges on the ebb-tide, independently of the facility afforded to the inland river navigation in thick weather during the winter months.

Should the object of my troubling the Right Hon. the Lord Mayor and Corporation, with the perusal of this letter fail in meriting their regards, I have only to beg you will do me the honor to plead my apology in having presumed to obtrude on their official labours.

And with the greatest respect subscribe myself, Sir,

CHARLES HENRY ACKERLEY,
Lieutenant in the Royal Navy.

To H. HOBLER, Esq.
Secretary to the R. H. the Lord Mayor.

Mansion House, 12*th July*, 1833.

SIR.—The Right Honorable the Lord Mayor has directed me to submit your letter to Mr. Hobler, and received this day, to the consideration of the Thames Navigation Committee, at their next meeting on the 1st of August.

I am, Sir, your most obedient servant,

NATHANIEL SAUNDERS,
Sub-Conservator and Water-Bailiff.

To C. H. Ackerley, Esq. R.N.

The Navigation Committee at the Guildhall did not sit till the 2nd of August, when Lieut. Charles Ackerley was permitted by them, after hearing his letter of the 9th of July read, to communicate his views which have now been condensed in the *Observations* that follow; and subsequently, agreeably to the custom of his profession, he announced the same to the Lords of the Admiralty, in reply to which, he received the following letter:—

Admiralty, 3*rd August*, 1833.

SIR.—I have received and laid before my Lords Commissioners of the Admiralty your letter of the 2nd instant, with the accompanying plate (which is here returned,*) "relative to the application of Gas on the Bridges for the improved Navigation of the River." I am, Sir,

Your most humble servant,

GEORGE ELLIOT.

C. H. Ackerley, Esq. Lieut. R.N.
43, *Davies Street, Berkeley Square.*

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* The Engraving of Vauxhall Bridge alluded to. (By the Author's request.)

OBSERVATIONS

ON THE

NECESSITY FOR LIGHTING THE NAVIGABLE ARCHES

OF THE

Various Bridges

WITHIN THE

JURISDICTION OF THE CITY OF LONDON,

Either through the medium of GAS, *or the application of other means, equally beneficial,*

FOR IMPROVING THE NAVIGATION OF THE RIVER THAMES.

FROM a variety of information obtained through persons of experience connected with the inland commerce of this country, the writer of these remarks considers himself enabled to justify his opinion on the project he proposes, by stating,

1st,—That the local Acts of Parliament to Private Companies for the construction of various Bridges above London Bridge, militate against the chartered jurisdiction of the Right Hon. the Lord Mayor, as Conservator of the river Thames, inasmuch, as the Corporation have no power over these recent edifices to effect those ameliorations, which the Trinity House is ever desirous to afford to the shipping interest on the sea-coast by means of "lights and fixed buoys" in intricate navigation,

nor to appoint a responsible person to take care that such lights shall not be neglected.*

2nd,—That the space of nineteen miles between London and Brentford, where the inland commerce by the Thames commences, is without either of those facilities for the better security to vessels navigating the river.

3rd,—That vessels of a tonnage from 40 to 100 tons, are compelled, after they have been laden and unladen, to depart oftener by night than by day, in order to reap those advantages of the first-flood, necessary for arriving at the basons appertaining to the Junction† with the river Thames, formed at Brentford and Teddington, in proper time for entering the grand western arteries of the inland water communication with the metropolis.

4th,—That the loss of time which commercial enterprise sustains, is not so great on *the rising*

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* "A legislative act has no reference to any rule but these two; original justice, and discretionary application. Therefore it can give rights—rights where no rights existed before; and it can take away rights where *they were before* established."—*Burke.*

† The toll for vessels from the Grand Junction Canal to London, is 1½d per ton. On the Thames navigation, this includes, however, the passage *to* and *from* London, being 1½d. per ton for the voyage, and *not* on the *actual*, but on the *register*, tonnage, which in ships are widely different.

tide; and in the common course of such transactions, the loss of such portion of time is viewed with indifference rather than otherwise, as proceeding from *known causes:* but, as the dictates of nautical tactics, as well as of common prudence, teach us to attain the object in view with the least loss of time, and least injury, so the writer rests his arguments on the course which common sense points out as being best adapted to the interests of the merchants.

The writer was given to understand,—a few days before he was honored with an audience in support of his proposition before the City authorities at the Guildhall—that considerable opposition was likely to be made by a component part* of the Corporation,—a most influential body of men, the River Pilots,—to any innovation in what was conceived to be *the vested rights of their community;* and in their opinion, a gas-light† so near the water, as above high water-mark, resembling those on the shores of the river, would tend ma-

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* "Where a Corporation is composed of several persons, it has the power of acting as an individual for certain purposes, and of sharing in common whatever privileges it possesses."

† The estimated expence of a gas-light in an exposed position, is about ½d. per hour.

NATE THE

VAUXHALL BRID

SE&E & NW&W.

WESTMINSTER BR

EAST & WEST.

WATERLOO BRID

SSE & NNW.

SOUTH & W & NOR

BLACKFRIARS BRIDGE.

SOUTHWARK BRID

SSW. & NNE.

LONDON BRIDGE

S. by W. & N. by E.

INSCRIBED

In Miniature of those Pres GRACE the DUKE of RICHMOND

MAYOR and CORP and D'AUBIGNY.

terially to mislead, and do harm by producing accidents.

The writer weighed well this opinion, and the objection, which mere chance placed him in possession of, only three days before the meeting alluded to in the letter from the sub-conservator and water-bailiff; the result of which consideration is, that he has effected an alteration of the *colour* of the light in the position proposed, by introducing into the lamp *(as represented in the engravings in illustration before the Committee) red-stained glass*, as a more certain indication to the only passable channels under the bridges on the ebb-tide. This is the more essential on the starting of the upward-bound vessels on the first flood-set, for passing the only navigable arches of Blackfriars and Waterloo Bridges, especially the latter, as the bank under the third arch "brought up"* the greatest number of vessels in dark and thick weather by not taking the arch in shore of them, thereby occasioning the *said vessels not only to lose part of the tide upwards*, but rendering those inward-bound unable to arrive and enter into the canal, and proceed on their voyage

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"Brought up" is a nautical term to express vessels grounding on a bank.

into the interior of the country, till *the succeeding rise of water.*

Conformable to *the vested rights** before alluded to, which support that valuable class of men the "river pilots," bargemasters are required to take a pilot down to London, but at times otherwise,† which bye-law occasions frequently the self-opinionated to damage their owner's property; for the greater proportion of west-country masters of barges do not take pilots, but trust to their own skill, and from that circumstance, evil-disposed persons on the shore produce many disasters to the commercial world‡ by their interested endeavours to lead these men astray, in order to cause labour and its consequent reward to themselves and friends.‖

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* Vide Appendix—Liverpool.

† All boats and barges out of the Grand Junction canal, or from *below* Windsor, are obliged, under a penalty, to take a qualified waterman as pilot, at six shillings per diem, down to London.

‡ *Vide* Appendix.

‖ The west-country barges, (termed "*monkeys*" on the river,) and all boats conveying merchandise, coming from *above* Windsor, are pilot free; but on the homeward bound voyage up the river, the city tonnage, on a barge of sixty tons, is seven to eight shillings, and so on in proportion. The exactions or tolls, on the Thames navigation in the *City district*, namely, up to the City-stone at Staines, are as follow, including the tolls at the locks, (which are 4d. per ton at each,) being also on the voyage down and up.

The conveyance of merchandise by night, and in thick weather, by such a precarious mode of navigation as that of counting the number of lights ("*lamps*") on the bridges, situate on the buttresses, either commencing from north to south, according to the west-countryman's determination for "*shooting*"* his vessel between two of these lights, is, in my humble opinion, evident to every person possessed of nautical intelligence, as deserving of serious consideration, when impartially perusing the following observations.

When vessels approach the arches, (the greater

* Applied to the rapid descent through the arch of the late London Bridge on the ebb-tide; in the phraseology of the river, "shooting London Bridge."

	Per ton on the Register, and far below the actual tonnage.
	s. *d.*
To Strand, Kew, and Brentford	0 1½
Isleworth and Richmond	0 2½
Twickenham and Teddington	0 3½
Kingston (including Teddington)	0 7
Ditton and Hampton Court	0 8
Hampton	1 0
Sunbury	1 0½
Walton, Shepperton, and Weybridge ..	1 4½
Chertsey	1 9½
Laleham	2 1½

To Staines and all above it, 1s. 3d. per ton, *down* and *up*, and that not on the register tonnage, but on the number of tons the vessel is laden with, consequently if she is empty, either on the

number being guided by one person, with a "*sweep*"* in addition to the power of the rudder, by the "bow and quarter" effect given by that lever, in co-operation with the different sets of the ebb-current,) it is not unusual to hear the stentorian voices of mischievous persons endeavouring to pervert the judgment of the conductor as to the best passable arch. The result is as may be conceived, from an oblique sheer being given too late for avoiding the accident, which in the phraseology of the river is termed the "sliding-blow," against the angles of the buttresses,—and which, communicates a shock, that makes every nail in the vessel, as well as the master's frame, shake, from the consequence of not taking, or being necessitated to take, the necessary precautions in having a certain mode of avoiding such dangers connected with river navigation. The

* A large oar used as the lever of guidance instead of a rudder, where there is none.

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up or down passage, *no toll* is paid for her. The Thames navigation above Staines is under the management of the commissioners of the upper five districts, and 2d. per ton is paid for the toll at each of the locks through which a vessel passes between Leachlade (above Oxford) and Staines on each passage, viz. up and down, upon what the vessel has on board. The city toll is only taken on vessels above three tons burden.

concussion then given is either on the bow, the quarter, or a little abaft the midships—the latter being most severe, by causing a straining of her extremities, similar in effect to a ship's breaking her back—the consequence is, the vessel swamps if not speedily grounded.

The precaution of leakage, and great consequent expences to the owners of newly-built vessels, are the after consideration of *those most concerned;* but, what the public is likely to sustain is of still greater consequence, from the construction of the piers being exposed to these reiterated shocks, similar to those of the "battering ram;" *the concussion from which,* in my humble belief, must produce vibration through the whole superstructure of the "pier."* In support of this idea, we have evidence of the injury received by the piers, discovered on the removal of the Old London Bridge.

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* So convincing was this idea to a scientific person, that he referred the opinion to the masons usually employed on the river about the bridges that, "if a glass of water, filled to the brim, was placed on the buttresses of *Blackfriars Bridge*, whether such a blow as above described, which would occasion the displacing of strongly cemented masonry, would cause agitation of the water in the glass?" The answer was, "*on the bridge alluded to, they conceived it would.*" If this is the case, it would appear to prove that this bridge (Blackfriars) requires sterlings as much as the Old London Bridge.

Fissures in the masonry, generally tending in a vertical direction on a line with the buttresses, were apparent in many places; and from what personal information, as well as historical statements, the writer has been enabled to collect, must have taken place in periods prior to the erection of preventatives, to remedy the effect produced by large vessels, in strong easterly gales getting adrift, and thwarting the abutments below the bridge during the violence of the flood-tide, and *unusual phenomena* by the sea as lately evinced,* and in such position communicating that shock so injurious to the foundation; the prevention of which, as well as from floods† as from ice, caused in after years the erection of *sterlings,* the bridge being then in such a ruinous condition "that," says *Herbert,* on the late Conflagration of the temporary Bridge, the 11th of April, 1758, "in the year 1666, the very stone work being so weakened thereby, that it cost £1500 to repair the piers and arches, together with its drawbridge,‡ laid in 1622."

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* Godwin sands. *v.* Fab. Chron. p. 7, Stow, An. Engl. A.D. 1099.

† Maitland's Lond. b. 1, p. 22

‡ "In 1672, the drawbridge being then decayed, after it had been laid just fifty years, was taken up and a new one began to be laid, which was completed within the short space of five days."

From the extreme narrowness of the bridge at this period, it was judged necessary "*to widen it over and through;*" and as a further security to the centre arch, a "pier being taken away, an external line of arches on piles was constructed about the year 1748, having a projecting colonnade [*vide appendix*] for pedestrians, opened first on the north-east side." And also for the primary consideration of stability, to the ancient as well as the modern edifice, additional sterlings were projected, thus accounting for the appearance of three distinct bridges under one construction, as was apparent on the removal of the superstructure of the Old London Bridge. The writer may be considered as diverging from the subject "whereon the main strength of the object in view dependeth;" but, in directing attention to the historical allusions of the periods named, he does it under conviction, that a national advantage may accrue from some evident facts arising therefrom, on this as well as other extraneous subjects; and cannot resist adverting to "*the projecting colonnade for pedestrians,*" as a most beneficial improvement to all narrow bridges throughout the kingdom, especially those named,* by having a footbridge fixed on the out-

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* *Vide* Appendix.

side of the parapet, from angle to angle, [*vide diag. fig.* 6 *a*,] observable in all these ancient edifices, and thereby obviate the frequent accidents which both male and female persons are exposed to, from sudden concussion, and being brought in contact, with vehicles of all descriptions in their passage across such narrow causeways.*

The damage likely to be sustained by the bridges on the Thames is most to be feared on the falling tide, the blow† being given nearest to the point of junction of the masonry, with the wooden foundation of the piles, with such accelerated force‡ of wind and tide, on a deep laden vessel, as completely to remove the strongly cemented stone-work into which "*the ring-stones*" [*vide fig.* 1 *a*,] are rivetted on the western side of the bridges above the Southwark communications with the city.

The extended navigation by steam, with similar

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* *Vide* Appendix.

† The falling of a part of the balustrades of some of the bridges was probably occasioned by shocks of this nature.

‡ Intelligent workmen on the spot, employed in repairing the masonry alluded to, were firmly of opinion, that whatever damage the structure of the bridge experienced, it was produced by the frequent concussions the foundation received on the ebb-tide, and it was greatly to be feared would be felt more by Blackfriars Bridge than all the others.

accidents therefrom against the bridges within the jurisdiction of the municipality, and the increasing application of its power as to the towage on the canals, as well as of *inland merchandise* up the navigable Thames*, in competition with "rail-road rapidity" to and from the metropolis,—are additional arguments for facilitating,† the natural avenues of approach by water to the city of London; and if the inland commerce of the country, by canals, suffers, or has even felt, any detriment in consequence of the precarious navigation through the bridges on the Thames, that forms a sufficient argument, why the plan now proposed, should be strongly supported, by all who are interested in the preservation of Canal property. We cannot be surprised at

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* A steam-boat of a new construction, flat bottomed, and similar to those used between Havre-de-grace and Paris, will shortly be in use on the river.

† During the author's short visit of a few hours to "Liverpool," he collected the most convincing evidence as to the reason for the *violent opposition* to a toll, or proper disposition of *lights* for *leading marks*,—which, for these four years, has deprived this port and the United Kingdom of some thousands sterling, annually, through the influential designs of the interested—as to prove to him the force of his quotation, p. 3. It is truly singular, that the leader of this opposition was the first to come forward and acknowledge the advantages of the light vessel now placed, from whose position he lately derived his personal succour, during the prevalence of the gales of December, 1833.—(*Vide* Appendix.)

accidents happening at "Fulham," or "Battersea" bridges, when the breadth of the arch, only *exceeds by three feet* the distance between the paddle-boxes and the piles, as for instance,—the damage the *Diamond* steamer sustained, by the concussion against the *uprights* of Fulham bridge from bad steerage.—[*Vide Appendix and Diagram.*]

The writer begs to conclude his observations by stating, that in his short intercourse with the authorities at the Guildhall, he discovered, that in the archives of this ancient city, there was not a single complete plan of the bridges, within the boundaries of the metropolitan jurisdiction. He, therefore, seized with pleasure the honor and opportunity offerred to a naval officer for filling up that deficiency amongst their records, by presenting Engravings of Plans of the Bridges before mentioned, by some of the celebrated architects of the present day, to the Right Hon. the Lord Mayor and Corporation; together with others, the best prints extant, of *the original* and late London bridge in its most ancient state, with observations thereon*; also, [*vide appendix*] as illustrative of his idea of illuminating the navigable arches on the ebb-tide, agreeably to

* On the evident change of channel in the river.

the suggestion contained in the following official letter, dated the 9th of July, 1833.

Reply to the Author's letter, dated 9th July, 1833.

Guildhall, London, 19th Oct. 1833.

SIR.—I am directed by the Committee for improving the Navigation of the river Thames, and for preventing encroachments on the said river, to express to you their best thanks for your suggestion for placing lights to designate the navigable arches of bridges, together with the Engravings of several of the Bridges over the river, which you were kind enough to present to them; and to inform you, that the Committee have taken the subject attentively into consideration, and have examined several watermen and lightermen* who have been accustomed to navigate the river for very many years, all of whom are of opinion, the placing such lights is objectionable, as they would tend to do harm by producing accidents, and that it would consequently be better to be without them. And they further stated in illustration of their opinion, that the lamp, which had been put up over the navigable arch of Kew bridge, has always been objected to by the bargemen navigating the river.

I am Sir, your obedient servant,

HENRY WOODTHORPE.

CHARLES H. ACKERLEY, Esq. R.N.

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* Individuals, influenced by interested motives or false views, may check for a time the progress of improvement—moral causes may produce a momentary slumber of the public spirit—but, sooner or later, the spring-*tide* of their growth will display that influence which true philosophy never will despise.—[*Vide Paris's Life of Davy.*]

TESTIMONIAL *of one of His Majesty's flag officers, in favour of the Author's plan.*

Beech Hill, Haddington, N. B.
October, 15th, 1833.

DEAR SIR.—Many thanks for your letter, and the valuable information it contained. I think your friends who navigate the Thames will benefit much by your suggestion: and I hope the board, under whose consideration it is now placed, will give it the attention it merits. You, no doubt, will have a great deal of opposition to encounter, but you appear to have the talent of surmounting every thing of that description. I hope to have the pleasure of meeting you when in town in the spring.

And am, dear Sir, truly yours,

PATRICK CAMPBELL.

LIEUTENANT ACKERLEY,
Maugersbury House, Gloucestershire.*

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* The seat of the author's brother, J. Chamberlayne Chamberlayne, Esq. and in answer to the Enquiries of Mr. Turner, R.A. in his "Annual Tour,"† for 1834, c. 3, p. 52, 57,—*vide* Atkins, 365, *et* Rudder's Glouc. 705, 706; *etiam* M.S. Roy Lib., 3rd Roy. Char. L.S. Lond., de Antiquis Legibus Liber; *et* Maitland, pp. 30, 561, 568, 570.—*Vide* MS. St. Ouen, Lib. No. 86, Cart. St. Georgii de Boschervilla, Rouen; *et* Herald's Coll. Lond. Wotton's Bar. Vol. I. p. 567; *et* Arm. Bear Chas. I pp. 34, 178. Collins's Augm. by Sir Egerton Brydges—Vol. I. pp. 141, 165, p 240. Vol. II. pp 421, 501, [6] 520, 523. [u] Vol. III. p. 433. Vol. IV. p. 203. Vol. V. pp 236, 331, A.D. 1677, p. 401. Vol. VI. pp. 372, [e] u714, [x] 721, [6] 728, A.D. 1740, p 729, A.D. 1739-92, p. 730 to 731, A.D. 1778. Vol. VII. p. 38. [2] Vol. VIII. p. 178, 36th of H. VIII. pp. 263, 398, 400, 549. Vol IX. pp. 155, [3] 422, u120 459, n53—1st & 2nd William IV. c. 25. Burke's Baronetage—Vol. I. pp. 166, 269, 455, 518, 568, 570, 680. Vol. II. pp. 341, 477, 501, 558. According to Doubleday, in the Archives du Royaume, Hotel de Soubise, sect. historique carton. j. 642, is a deed of Jean de Mellun, Comte de Tankerville, dated 22nd July, 1366. The seal affixed agrees with the crest and quarterings of the Maugersbury branch, Camerarii de Tankerville, in Britain

† Allusions to "Wanderings by the river Seine," by Leitch Ritchie.

The opinion of Admiral Campbell will be best appreciated by the world, after reading the following letter of the celebrated Admiral Collingwood respecting him.

Ocean, January 14th, 1807.

"I am much obliged to you, my dear Clavell, for your letter of the 1st October, and give you many thanks for your wishes. The Adriatic, I hope, will prove a good station for you, until something better can come; and whenever I have it in my power to promote your interest in any way, you may trust me that I will not forget your zeal and activity for the public service. I sent you where you are because I had confidence in your diligence, and thought it probable that much would be done there by so active and intelligent a man as Captain Campbell. Cultivate his esteem: he has a deal of enterprise, and can step out of the beaten path to do a good thing. You will gain experience, and that will fit you to fill the superior stations to which, I hope, you will speedily arrive. Cherish your men, and take care of your stores, and then your ship will be serviceable. They are articles very difficult to recruit. There never was an idea of my leaving this station for any other; there seems indeed so much to be done here, that I do not desire it; and I hope my Adriatic squadron will have a great share in it."—*Ekins' Naval Battles.*

In concluding these pages, the Author would feel conscious that he should not act right, did he not advert to a politeness that stimulated his zeal, on finding that his nautical views were appreciated and

sanctioned by the nobleman who kindly transmitted his plan to the Administration "des Ponts et Chaussees," at Paris, [*vide appendix,*]—in consequence of learning from a distinguished foreigner that such suggestions, as contained in this work, would be equally as efficacious on the river Seine as on the river Thames.

The author must not omit to allude to the urbanity that was evinced toward him, throughout his intercourse with the city authorities at the Guildhall; but to their opinion, as expressed in Mr. Woodthorpe's letter, before inserted, he begs to oppose that of one of His Majesty's flag-officers, with whom he had the pleasure of serving, as second lieutenant in H.M's. ship the *Ocean,* of 80 guns. In doing so, the author is not actuated by any inimical feelings, but, in justice to himself, and by way of proof to those of his profession, who may deign to honor these Observations by a perusal, he wishes to convince them, that his exertions have been unremitted in endeavouring to effect the object, which accidental circumstances suggested to him to advocate.

END OF OBSERVATIONS.

APPENDIX.

☞ *In bringing forward in this Appendix some matters more or less Explanatory of the subject of this Pamphlet, the Author has been led to introduce some notices (of a professional nature) or connected with his professional services, which, he trusts, will not be condemned as altogether irrelevant.*

APPENDIX.

PREFATORY

REMARKS ON THE DIAGRAM.

THE WHEEL.*

THE Steering-wheel, (*fig.* 1,) is merely mentioned by Falconer and Burney in their Dictionaries, (but not in Darcy Lever,) without any information relative to any data and introduction on board-ship.

The Diagram, in its principle, has never been represented as here pourtrayed. The author's reasons for elucidating this simple contrivance (in use about three hundred years, and adopted on the

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* On a rough-spun worthy presenting himself for admission into the British Navy, the following scene usually occurs before the officer in command: "Well, sir! can you *reef*, *steer*, and take the *lead?*" "Lord bless your honour! Yes." "Well said, my hearty! go to the *Wheel.*"

> If, my hearty, you'd not like a lubber appear,
> You must very well know how to hand, reef, and steer;
> Yet a better manœuvre 'mong seamen is found,
> 'Tis the tight little maxim to know how to sound;
> Which a sailor can tell from a bay to a shoal,
> But the best sort of sounding is sounding the bowl.
>
> All men try for sounding whenever they steer,
> Your nabobs in sounding strive hard for Cape Clear;
> And there is not a soul from the devil to pope,
> That could live but for sounding the Cape of Good Hope;
> No fear, then, or danger our hearts shall control,
> Though at sea we're in soundings while sounding the bowl. DIBDIN.

There is no greater scorn can touch a man of reputation and place than to be thought not to understand his own business.—*Cæsar's Com. b. 7, ch. 7.*

construction of two-deck ships) are obvious, as well as his intent in making more apparent its *inutility* on board single-deck ships when used as the guiding power to rapidity in sailing.*

The author is borne out in this opinion by his communication with several scientific persons on the subject, made the more gratifying, as the idea elicited the following impromptu from His Majesty's surveyor of the navy:—"So convinced am I of its *inutility* in single-deck ships, that in those I commanded (particularly the '*Calliope*') its removal and steerage by tillar, made half a knot difference in her rate of sailing."

To this gentleman's civility I am indebted for being allowed to collect the following information in relation to the "steerage wheel," and by his sanction, to inspect the most ancient records and models in his department.

No record exists at the Admiralty on the period of its introduction into the British Navy, neither is it visible in the most ancient models of the *Great Harry*, built in the reign of Henry VII., or the *Sovereign of the Seas*, in the time of Henry VIII., the latter being as many tons measurement, as the date of her construction at Woolwich dock-yard, A.D. 1637;† or, the *Bristol* of fifty guns, in 1666. Nor is it to be seen in a model of a two-deck ship of the year 1701, having the initials of "I. L." in the centre of the stern. The wheel's position is abaft the mizen-mast, the barrel of which (*vide fig.* 1, *d*,) is before the man that

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* The more a ship increases her velocity with regard to the sea, the more powerful will be the effect of the rudder, because it acts against the water with a force which increases as the square of the velocity of the fluid, whether the ship has head-way or stern-way.—*Burney*, p. 193.

† The rival of these ships was the "*Henri Grace-a-Dieu*, constructed at Erith, said to have measured 1000 tons, carrying 4 masts, and mounting 80 *murdering pieces*."—*James*.

steers, customary at this period, and observable in all the plans of a favorite class of small frigates of 400 tons, mounting 24 guns, between the years of 1740 and 1750, when the fashion of steering before the barrel first appears (*vide fig.* 1,) in the *Deal Castle*, of 400 tons, mounting 24 guns, in 1754, in a vertical line above the tillar-head below.

In all the plans of line-of-battle ships* of the seventeenth century, the double wheel is remarked, but in the same position as in 1701, and observable in the model of the "Victory" which foundered in the British channel in 1744, commanded by Admiral Sir John Balchen; as also, in the model of the three-deck ship spoken of by Ekins, p. 29, in his "History of Battles," as follows:

"In all the battles of Sir George Pocock, appears the respected name of KEMPENFELT, Captain to Admiral *Stevens*,† who closed

* It is only within these last fifty years, that the old 50's upon two decks were thrown out of the line-of-battle.

† This surname carries with it such powerful associations connected with the poor from Placentia, as well as those of the city of St. John, Newfoundland, that it would be sacrilegious to pass over the occasion for pourtraying the same motives, although at distant periods, that actuated naval officers in the display of those kindred feelings arising out of goodness of heart. Placentia enjoys the singular honor, amongst the transatlantic possessions of these realms, of a communion service of plate, the donation of Her revered Majesty, the consort of George III. St. John's—the unique establishment of a theatre* under government-trustees,† the produce of which, since amateur theatricals were established by His Excellency Sir Charles Hamilton, Bart., at this period His Majesty's representative, has amounted to about £5,000. The support of the poor through this medium, has existed till this winter, 1833;‡ and for these last ten years, principally from the exertions of a descendant of the distinguished officer mentioned by Admiral Ekins, who is now deprived of his support in consequence of a late reduction in the office of deputy-assistant commissary.

* About the size of the "Olympic."

† The grant of land was obtained by the Author.

‡ Vide---Newfoundlander, 14th November, 1833, and public encomiums in the Gazettes of that colony.

his useful and honorable career by the unfortunate sinking of the Royal George at Spithead, in 1782."

The period of the navy-board order for fitting the steerage-wheel before the mizen-mast, the author cannot arrive at, but from what information he has acquired gives it the date of 1800.

EXPLANATION OF THE DIAGRAM.

Fig. 1—The Steering-wheel, in common use on board of single-deck ships. In line-of-battle ships its position is in the centre of the deck, "under the poop awning," before the mizen-mast, but with another circular wheel, with spokes at the end of the barrel, *d.* The post of honor in steering is the weather-side of the ship, termed "*weather wheel,*" for the able seaman, with his eye on the compass; behind him a marine; at the lee-wheel, opposite the A.B. is an ordinary seaman, and in his rear a landsman. The three personages named are assistants to the *helmsman* in turning the wheel, and acting under his orders. In battle, the master of the ship* stands between the compass and the wheel, (*vide diagram*) and from thence "conns" the ship. At times, during heavy gales of wind the greatest confusion and catastrophe arise through carelessness in the

* In several general actions, this officer has been taken out of his professional line, and made post-captain for his dexterity in this essential branch. The present Admiral Bowen† formerly held the situation of "master," and from his

†—"by this time the 'Jacobin' had got nearly abreast of the 'Montagne' to leeward, the very position which the 'Queen Charlotte' herself had intended to occupy. Scarcely, however, had Lord Howe expressed his regret at the circumstance, than Mr. Bowen, the master, observing by the motion of her rudder that the 'Jacobin' was in the act of bearing up, ordered the helm of the 'Queen Charlotte' to be put hard-a-starboard; and so little room had the British three-decker to spare in luffing-up, that her jib-boom grazed the larboard mizen shrouds of the 'Jacobin."—[James's Naval Hist. of Great Britain.]

helmsman, witnessed by the author when second lieutenant of an 80-gun ship; a sea strikes the rudder at *g*, the quartet at the wheel are thrown with great force in all directions. To prevent a like occurrence, men are stationed below on the lower deck with tackles attached to the tillar head,* *h*, in case that instrument, *k*, as in *fig.* 1, *k*, or *fig.* 3, *b*, should become unruly; the speaking-tube at *b*, denotes the means of communication with those below. The helmsman is relieved every two hours, and it is the duty of the officers, on the changing of the watch, to see this important personage first relieved. In the merchant service, three raps on the deck over the heads of the seamen denote the relieving of the wheel. *c*, a circular graduated dial plate, *inventor not known, or when adopted*, but says Burney, "is a small piece of wood traversing in a groove across the front of the poop deck, and which, by communicating with a small barrel on the axis of the steering-wheel, indicates the situation of the helm below, left or right." *d*, the barrel; *e*, the staple that confines the centre of the tillar ropes,† traversing *f*'s, till made fast at *k*, termed in nautical phraseology the standing part of the tillar rope; *a*, a mark on the centre spoke indicative of the rudder *g*, being in midships, or on a line with the

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skill displayed in conning the *Queen Charlotte* into battle, on the 1st of June, was promoted to a lieutenancy, by Lord Howe, and from thence proved himself to the country worthy of the discrimination of the commander-in-chief. The master, in the navy, takes rank on board ship after the junior lieutenant, but holds a situation next in *responsibility* to the captain. This office has been held by some of the most distinguished sailors from the merchant service, and may be considered as the only door of admission (in the case of war) into the British navy, for the *natural talents* of the country enlisting under such honorable banners.

* Hide is frequently made use of; several patents have, however, been taken out for a peculiar species of rope for this particular purpose.

† The tillar ropes are influenced by the state of the atmosphere, and at times, when relaxed, occasion serious confusion to the steerage, by the turns round the barrel riding one over the other.

ship's prow; *i*, the proposition of the author, p. x, l. 12, Appendix; *g*, the rudder pendants, always to be seen festooned from the rudder round the ship's quarters outside, in readiness to steer the ship should the tillar, *k*, be carried away; *n*, the binnacle, a wooden case or box which contains the compasses, log, and watch-glasses, *m*, with lights to show the compass. "There are always two binnacles on the deck of a ship-of-war, one being designed for the man who steers, and the other for the person who superintends the steerage, whose office is called *conning*."

Fig. 2—The Turk's Head, a sort of plait, the ingenuity of which consists in secreting the ends, and considered the *ne plus ultra* of sailors' embellishments. It is to be seen and touched before going on board of every ship of the present century that "sports a fashionable coloured *man-rope*" for getting up her side; it meets the eye, when severity is necessary, on the handle of an instrument of castigation; in battle it rears its head the "highest of the high," at each end, (two feet asunder) on the double-walled knot of the "rigging stopper," used with Flemish sennet to join the two ends of a shroud when shot away. This ornament, as a symbol of intrepidity, must have been introduced into the naval service of Europe at the time of the Crusades, and in after times, "the mere allusion to a turban," says Gibbon, "created such consternation throughout the Christian world, from the conquest of the Moors, in Spain, to that of Constantinople," that it fully implies, even to the commencement of the nineteenth century, the prevalence of the early imbibed impressions of a "black-a-more,"* "a very Turk."

* There was scarcely a ship during the late war, and even at present, which had not one of these faithful subjects of His Majesty, possessing the united qualities of "seaman and swimmer" in an eminent degree.
Nature indicates the means in other circumstances, but through man's perversity her designs are often frustrated.

Also, the phrase of Roxalana, in "the Sultan."*—In the French navy, its appellation is "tête de more."

Fig. 3—The most ancient manner of guiding a vessel. Burney says, "The perfection of steering consists in a vigilant attention to the motion of the ship's head, so as to check every deviation from the line of her course in the first instant of its motion, and in applying as little of the power of the helm as possible. By this she will run more uniformly in a straight path, as declining less to the right and left; whereas, if a greater effort of the helm is employed, it will produce a greater declination from the course, and not only increase the difficulty of steering, but also make a crooked and irregular track through the water."

Fig. 4 & 5—Indicate the principle on which complicated machinery is applied to steerage,—as occupying less space, more than of real utility—put in motion by horizontal and vertical wheels, as in *fig.* 1, *a.*

Since the enormous increase of smaller dimensioned steam-boats plying on the river Thames, the legislature in its wisdom regulated their speed to legal adjustment. At the same time the author cannot omit awakening the recollection of two serious accidents occasioned by the "concussions against Fulham and Battersea Bridges," &c. p. 13.† He also begs to observe, in drawing attention to his Appendix and Diagram, (*fig.* 1, 4, 5,) that the system of complicated machinery, he conceives, was never intended for governing the motion of extreme rapidity, and *that*

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* *Bickerstaff*, the author, was an officer in the Royal Marines.

† The paddle-box beam of the following steamers, *Fly*, *Endeavour*, and *Diamond*, average from 24ft. to 26ft. The breadth of Battersea and Putney navigable arches average from 28ft. 10in. to 30ft.

The concussion and damage which the *Fly* steamer sustained against Putney Bridge, from carelessness in the steerage, produced a scene on board which may be imagined, but not minutely described. Those that did not go over-board fell in-board; ladies and landsmen, soldiers and sailors, were seen striking out, not unlike turtles on the beach of the island of Ascension.

now in use, principally from its being ornamental in occupying less space, than from its real utility in the steerage of these vessels, is *one* of the principal causes that has produced (although not mentioned) their legislative consideration, resulting from confusion on most ordinary occasions, from whence conclusions are drawn resulting from nautical experience. We offer the following remarks as meriting the regards of Parliament.

First,—That no steam boat should be permitted to navigate within the jurisdiction of the city of London, and rivers of the United Kingdom *steered* by wheels.

Secondly,—That the wood-work of the rudder-heads (*vide diagram, fig.* 1, *i*,) should necessarily be prolonged at least four feet above the deck, in order that the steerage by tillar, *fig.* 3, *b*, should commence *in still-water*, and thereby allow, as in the old Dutch vessels, an elevation of two feet clear above the heads of the *passengers*, as well as giving ocular proof to the person in command, as to the true position of the helm against inability and carelessness.

Thirdly,—That it should be rendered imperative by Act of Parliament, the general adoption of the Illuminated Compass on board of all steam vessels now in partial use in the India service, (*vide diagram*,) thereby guarding against a similarity of occurrence as occasioned the loss of the "Water Witch"* steam boat, from a

* The late steam vessel *Water Witch*, (says one of the proprietors,) left Tenby, made Milford and the Smalls-lights. From the accident that had accrued to the wheel, (*fig.* 1,) a temporary tillar (*fig.* 3, *a*,) had been "shipped," which caused the binnacle (*fig.* 1, *n*,) in which the compasses were placed to be removed "more forward," *in order for the man to steer, as at fig.* 3. The vessel, it is declared by the Captain, (a man in whom the greatest reliance has ever been placed by the public and his employers)—was correctly steered by compass throughout the voyage, but which to his astonishment struck about 7, p.m. on the 22nd of December, 1833, upon the Wexford coast, many miles

DIAGRAM

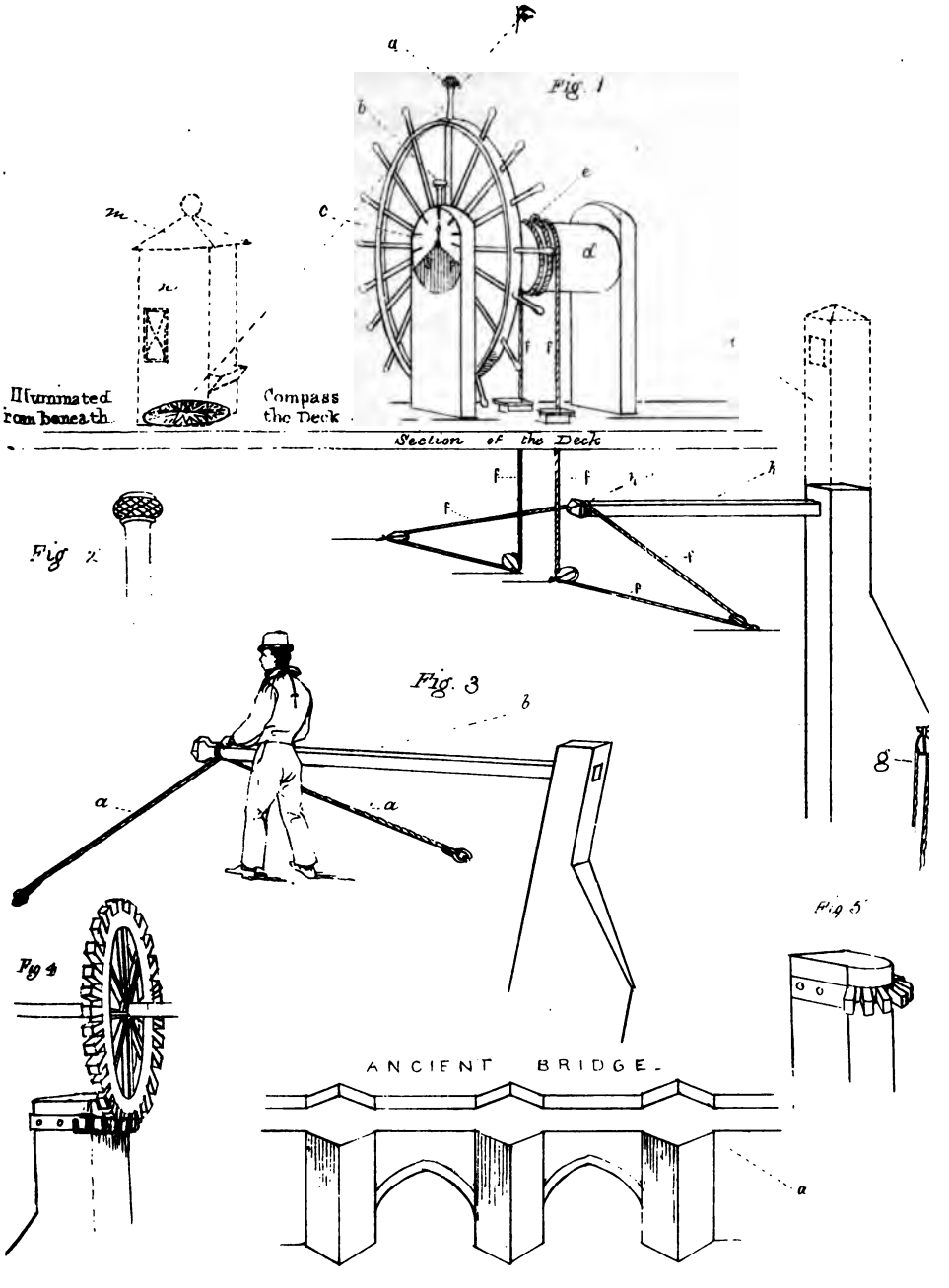

Fig. 6

Explanatory to those unaccustomed to Nautical Affairs.

BY C. H. ACKERLEY. LIEUT R. N.

1834

G. Rowe. Lithog Chel

disorganized machinery in her mode of steerage, as well as the dreadful effect on the compass, produced by being placed within the sphere of attraction.

Fourthly,—That no clearance should be granted from the Custom-house, without an affidavit being made by the master as to the number of (A.B.) able seamen* capable of *Steering by Wheel.*†

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to the eastward of its destruction. The captain attributes this misfortune to the compasses having been removed, and thereby bringing them within the attractive power of the "iron funnel." This incident speaks volumes in favor of proving the necessity for an imperative Act of Legislature, in preventing, by all possible human means, loss of life and property from similar misfortune, the inevitable consequence of not being provided with those means that would insure protection to his Majesty's subjects.

ADELAIDE STEAMER OF LIVERPOOL.—"It appears that at two o'clock on Thursday morning last, while off the Mull of Galloway, she was struck by a tremendous sea,‖ which washed all the houses off the deck, and swept over board Captain Shannon, her commander, who unfortunately happened to be in the house at the time, and we regret to state, was never seen afterwards. About two hours afterwards she was struck by another sea, which carried away the remains of her bulwarks, boats, davits, half the *wheel*, the greater part of the skylights, and half filled the cabin with water."—*Times of March 5th*, 1834.

‖ A heavy head sea produces an effect upon a ship that a novice experiences in taking his first flying leap, causing to the helmsman (as at *fig.* 3,) an intuitive movement to counteract the ill effects of not doing so, to save his masts, &c. and which the wheel at times frustrates by the flurry of the moment. "Ease her with the helm!" The non-observance of which causes about a ton of water to come on board over the bows, and on the rising of the ship, washes every body off their legs, creating a confusion to be imagined.

* On board ship there are three classes of men: A.B. able seamen; O. ordinary; L. landsmen. The primary qualities exacted from an A.B. is to *reef* and *steer.*

† One defect of the Steerage by Wheel is this, and of every day's occurrence in *blue* water—when officers demand of the steersman (*diag. fig.* 1) at the wheel, "How is the helm?" the oldest "hand" will sometimes be found inattentive or caught napping, responds, "*Ax your pardon, sir*;" but cannot give an immediate answer, until by taking a side-look at the "Turk's head," (*fig.* 1 and 2), or an oblique glance "before all" at the "Tell-tale," he reports its required position.

REFERENCES TO THE OBSERVATIONS.

[Referred to in p. 5.]

"Vested rights."

His Majesty's present government may, with justice, exclaim in the language of Augustus, that they found Liverpool "brick," but that in the estimation of future generations they had left it "marble." Having now placed that port on a basis of stability, they will shortly resign the produce of their scientific labours, in that part of the kingdom, into the guardianship and responsibility of the Corporation, whose revenues* bid fair to point out this city as the emporium of Europe; and from its position, the future capital of the United Kingdom, open as it now is, without "hap" or "cunning,"† to the commerce of the whole world. It is a fact, that notwithstanding the local spirit and enterprise at Liverpool, which in a few years have rendered it the second port of the empire, chiefly promoted by attention to its capacity for docks, &c. &c., all has been nearly sacrificed from want of foresight in making the necessary inquiries respecting its *avenues*. It may be said only to have been rescued from the class of *bar-harbours*, in the year 1833, by an Admiralty survey, under a Lieutenant Denham, R.N.;‡ which survey at once developes

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* The local dues of Liverpool have been £195,000 per annum, one fifth of the whole United Kingdom.

† C. Edmond's Cæsar's Com. b. 3 c. 7.

‡ It is to be regretted that the evidence of the superintendent of this survey, was not required by the Commissioners of Municipal Inquiry, relative to the extraordinary proceedings and attempt to thwart the designs of government and best interests of the State, as regards the discovery of the new entrance-channel to this port.

accessability to this great port at all hours of tide, night or day, instead of merely eight hours of each day, as hitherto. And this important matter is effected by simply establishing an additional light vessel with a single lanthorn of red-stained glass to be used in conjunction with an original sea-mark tower‖ on *Formby Point*, erected about the year 1690, *and now converted into a light-house*.§ The whole merit and results resting upon the selection of a proper position for such light vessel, and which nothing short of actual exploration of the whole region of sands upon trigonometrical principles, could have decided; and which emanating from the Admiralty Board, so proverbially alive to the maritime interests under their guardianship, must carry with it much honor and gratitude for these arrangements.‡

Prejudice was so powerful against the above amelioration, that the whole body of Pilots evinced a distrust to the discovery of "a new channel,"‖ and even urged the Corporation to adopt the designs of a civil engineer, for certain improvements in the navigation estimated at £20,000,§ till the late disastrous gales,

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‖ Formby tower, 144 feet in height. The position of its light is 72 feet, corresponding with the light vessel bearing a red-light at right angles, to the Cheshire light on Wallasey Rock Fort.

§ The author is credibly informed, that the civil engineer of the Corporation, on hearing of this discovery, proposed, and gave in his estimate for the construction of a light-house and vessel at £20,000; and that such proposition was acquiesced in by that body.

‡ The Lords Commissioners have sanctioned "the request contained in the petition from the Corporation of Liverpool," for *a section* from the grand North Western survey of England, being immediately published for the sake of general information.

‖ The depth of the new channel is from 26 to 29 feet. It is to be hoped that the discovery should, in honor of the zeal manifested, be commemorated by the merchants of Liverpool, as bearing the name of the person who first discovered it.

§ The remittance of Government by the Custom-house, has been weekly £20,000.

producing unheard of wrecks, brought this influential body to a due sense of their own preservation.¶

The author ventures to illustrate the above article by a geometrical figure in the imagination, as demonstrative of this important discovery. The channel of the river Mersey from Liverpool, runs into the sea, North, between two headlands: on the East (land), Formby Point, Lancashire,—on the West (land), Wallasey Rock Fort, in Cheshire. Let *a b c* be the imaginary acute angle triangle: a spectator standing on Formby Point, *a*, looking seaward to the West, measures with his eye a right line to a given distance, which will be *the base;* another person in Wallasey Rock Fort, *c*, on the Cheshire side, looks seaward, North, intersecting the line at *b*, *(the perpendicular)*, where there is a *light vessel shewing a red light;* he then directs his view to Formby Point Light-house, in Lancashire, which is the *hypothenuse* of the angle, *c b a*. Ships approaching Liverpool, by night, from the Westward, keep the red light *on* with Formby Point light, till passing within hail of the light vessel, round inward "hard-a-port," and steer due South, keeping the Cheshire light just open on the starboard bow, or leach of her foresail. Ships approaching Liverpool from the Northward, keep the red light exactly on a line with the Cheshire light, and steer manfully past the light vessel. This ingenious position of the *light vessel at b*, of the acute angle triangle, is the leading mark for both passages, with soundings for a large class frigate.

[Referring to page 11.]

Newport, Powick, and Evesham Bridges,*—breadth of causeway, from 12ft. to 13ft. 6in.

Tewkesbury Bridge,—breadth of causeway, 12ft. 6in.; parapet wall, 3 feet.

Hayford Bridge,†—breadth of causeway, 10ft. 6in.

¶ Out of twenty Pilots of the old regime, fourteen were drowned, by not giving credence to the survey and reported discovery of the new channel; the pilot-vessel containing these men, getting amongst the the breakers in one of the tremendous gales of this last winter, whilst running for the port of Liverpool.

* The above Bridges all embrace events of some catastrophe, more or less, resulting from the same cause.

† 19th Sept. 1831, Samuel Hart, driver of the *Alert*, was pitched into the Droitwich canal, in consequence of the leaders (a waggon having to back out) bringing the coach in contact with the parapet wall. Westbrook, driver of the

[Referring to page 13.]

The evident change within the last half century in the navigable channel of the river, more particularly within the space of three or four miles above the New London Bridge, proceeds from the following causes.

1st. The removal of the dam, or obstruction to the ebb-current, which the Old London Bridge caused, and which now occasions an increased velocity and ebb momentum, scouring away the mud, sand, and small gravel, at the same time prejudicial to some of the foundations of the bridges, if not furnished with sterlings.

2. The tendency its stream has to encroach in the first place on the Lambeth side, above Westminster Bridge, observable from its shingle banks, owing to the projection off Milbank, that gives an angular direction to the current through the easternmost arches of this bridge, leaving the westernmost arches unnavigable at half-ebb.

3. The total want of foresight in not turning to account (at stated periods of the low-ebb) the water that is constantly flowing through the viaducts, from the Regent's and St. James's Park Canal reservoirs, as well as the large common sewer, near Scotland Yard; the latter under the direction of the Commissioners, the former, the Board of Green Cloth. The effects produced by such a volume of water, would prove most beneficial in reducing an accumulation of mud and gravel from the Parks, which, in a period of forty years, have occasioned a rise on this shore from

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Hibernia coach, was nearly similarly situated on one of the above narrow causeways last year.

"Time, that great investigator of truth, discovers it the sooner, whenever these illusions of error are thus compelled to be exhibited in broad day." *Dupin.*

four to five feet, where, twenty years since, coal barges laid afloat off Scotland Yard.*

4. From the statements in the foregoing not being attended to in governing this influx of water (*vide* "Tunnel Act,") into the river, &c. it throws the currents of the river out on the first ebb-set, creating, on each side of this *impetus* an eddy, and an accumulation of mud, between a point below the westernmost arches of Westminster Bridge, and off Scotland Yard; and again, from thence to the Hungerford Market, off the Adelphi, increased in a great measure by the Duke of Buccleugh's causeway, and the effects resulting from a Private Act, 2. Geo. III, 1771, in favour of Adams, p. 5, line 13, viz. "buildings, ways, water, water-courses, profit, commodities, *advantages*," the latter word, sanctioning the said Adams to cast into the river sundry cart-loads of rubbish in the construction of the Adelphi buildings, and thereby occasioning a nucleus, the visible effects of which are as prejudicial to the navigation of the river, as to the coal merchants.

5. The current being *set off* the shore, named in the foregoing, the present channel of the river sets, from the Surry shore, to the innermost arch of Waterloo Bridge, and, from its strength, has a tendency to encroach on the inhabitants in that neighbourhood of Middlesex, so much so, that to the calculation of human foresight, within a very short period, all the arches of Waterloo Bridge, with the exception of the two most northerly, will become useless on the ebb-tide.

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* "There is less water at all the wharfs; this arises from the sewers depositing a quantity of soil, and no means taken to remove it. There is now a considerable quantity of soil passed into the Thames, which formerly used to be taken away."—(*Vide* Evid. of Mr. M. Lucas, a Custom house lighterman, 26th June. 1799. App. A. 2nd Rep. from the Select Com. of the House of Commons.)

6. From the channel of the river not being controled, by artificially governing its ebb-current (at this moment of the utmost importance to the well being of the city, its bridges, and inhabitants,) by an inclosure of certain parts of the waste bank, either after the cheap method used in the formation of the dykes in Holland, or by iron piles interlaced with sheets of the same metal.

7. The conclusive argument to be drawn from the following statements of two celebrated engineers, Messrs. Labelye (1739) and Telford, (1820-22-23) relative to the velocity of the ebb-current in its descent, verifies the foregoing remarks.—[*Vide* "Report to the Committee for letting the Bridge House Estates." Also, "Labelye's Report to the Com. appointed by Act of Parliament for building Westminster Bridge."]

"Were the Bridge removed, (the Old London Bridge), it is evident, that the velocity of ebb above bridge would materially increase; the time of low water be earlier than at present; the drainage of the upper ponds more complete; and the navigation which is now practicable up to Teddington, would cease too early near that place."—*Telford.**

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* "Notwithstanding all the precautions that have been, or may hereafter be taken, (says the most celebrated Engineer of his time, 1739,) to render the foundation of the Piers as firm and solid as if they were built upon dry ground, they will always be in danger of the water gulling underneath, and carrying away the ground from under the planked gratings, on which the piers stand.

"I know it has been urged, that if London Bridge is ever mended, by taking some of the piers away, or entirely rebuilt, the ebbing waters will fall to the sea in a less time than they do now; and consequently, that the velocity of the stream under the intended bridge would be increased, and occasion the ruin of the piers, on account of the gulling of the water under them.

"That if London Bridge should be entirely taken away, the utmost that could happen then would be, that the ebb-tide would run much less time than it does now. Let us again take the worst, and make it of no greater duration than the tide of flood, that is, a little more than six hours each; it will follow, in that case, that all the water that now takes up about eight hours in ebbing out, would ebb out in about six hours; and consequently, the velocity of the water would be increased nearly in the proportion of 6 to 8, or of 3 to 4, from what it will be after the bridge is built."—*Labelye.*

These truths hold good at this moment, evidently pointing out the necessity of sterlings to all the bridges, as additional security to their present precarious foundations.

[Referring to p. 17.]

The Author now approaches his Sicilian dangers, relying solely on the buoyancy of his composition and the courtesy of the reader for the protection of his frail bark as it passes by the Scylla of public animadversion, to which, in yielding to the solicitations of his friends he may expose it, by the insertion of some professional reminiscences, in the readjustment of its cargo under another language. The motives* in so doing may be considered as a latent endeavour to conciliate the reader's "mind of love;"† and if perchance successful, "to drop him gradually down"‡ the tidal stream of his argument, as if in continuation of the "River Observations." This desideratum, by a stratagem so innocent, may, it is hoped, occasion in many, under whose eye this may fall, a feeling of gratification, as relating to some historical events hitherto unpublished; the literary emanation from a main-deck studio,§ thereby grasping that ennui, which might overpower if not controled.

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* "A conscientious motive floats among the waves of public opinion with the lightness of a cork."

† "And as for the bond he hath of thee, let it not enter into your mind of love." *Shakespeare.*

‡ Nautical phraseology.

§ "A cabin, hardly ever free from the sound of noisy feet, oaths, and execrations, says a naval author of 1789; yet, in this limited and obstreperous corner I paid my court, and I hope not altogether an ineffectual one, to the muses." The oaths and execrations of the past age, afloat, have now given place to a more reserved behaviour, being as much discountenanced in the galley as the gun-room.—*Author.*

Londres le 30 *Juillet*, 1833.

La Lettre suivante est la Substance d'une Dédicace addressée au Lord Maire dè Londres.

A Messieurs les Administrateurs des Ponts et Chaussées, à Paris.

MESSIEURS,

L'adoption réciproque qui se fait aujourd'hui de tout ce qui est utile en Angleterre et en France, me fait désirer de contribuer au developpement des idées scientifiques, par un examen, qui émane d'un long service d'activité à flot;* et j'éspere ne sera pas considèré indigne de l'investigation d'un Officer de la Marine Royale Anglaise.

On dit, que la Préfecture de la Séine, prépare l'introduction

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* There is a period in every man's professional career, on which his retrospective views rest with peculiar satisfaction: whether it arises from personal endeavour, or resulting from *chance*; yet the mind, however, holds to it as an ideal good, whether those views be public or private. The services alluded to, have been, in all quarters of the globe, attended by the usual concomitants of fevers, &c. without even experiencing one of the most celebrated 'Dyspepsia,' *(a)* but counterbalanced by the balm of hospitality, and that kind reception which is to be found by naval officers, if they choose to make themselves sociable through the medium of other languages besides their own. To this circumstance it was owing, that the Author, together with Captain Gregory, of Stivic-Hall, Warwickshire, "*assisted*" as interpreters to their respective commanders, at the conference of Ibrahim Pacha, at Modon, *(b)* held on the 6th July, 1828, between the allied Admirals *(c)* and foreign Ministers. And on Aug. 3, following—(commemorated by the arrival of one of the Royal Yacht Club *(d)* through the representation of the kindness received on board Admiral Campbell's ship by the intelligent Mahomet "Caftan Näa-ci," *(e)* ("clad with zeal as with a cloak,) Ibrahim's envoy to his father,—was mainly instrumental, and solely employed as an intermediate with the prime minister *(f)* of H.S.H. Mahemet Ali; and through an accidental audience with the former, subsequently caused the landing from *quarantine* of the British Commander-in-chief at Alexandria, *(g)* and in the course of one week, to the astonishment of the Diplomatists of Europe, the signing of the Convention with the *Macedonian* (*h*) for the evacuation of the Morea, by the Egyptian army.—*For References to this Note, vide p.* xxiii.

du Gaz, partout dans la Ville de Paris; au sujêt duquel j'ai l'honneur de m'addresser à Messieurs les administrateurs des Ponts et Chaussées, relativement à l'application de cette espèce de lumiére, concernant la navigation intérieure, dessous les arches navigables des Ponts sur la Séine, ou de quelques endroits que ce soit applicable, particulièrement aux Ports de mer.

Le rapport de ma *suggestion* sera considéré en Comite devant la municipalité de Londres, selon la lettre marginale. [*Vide* Sub-conservators official letter, p. vii. Prelim. Obs.]

Je me permettrai d'ajouter les details de l'amelioration en Anglais, pour etre bien traduit, par un de vos agens officiels.

En continuant, l'adoption d'une lumière ainsi posée, ce sera une indication sûre aux arches navigables d'un Pont. Les Routes pavées des Ponts sur la Tamise, dans les limites de la municipalité de Londres, sont bien eclairées par le Gaz. En même tems, il y a des occasions frequentes oú le commerce de l'interieur souffre beaucoup dans les tems des brouilliards;* et pendant les longues nuits d'hiver, sans qu'on en tire l'avantage assez palpable d'accorder à peu de depense, toutes les facilités imaginables, pour la conduite sûre de la navigation de la rivière.

Les voitures, aussi peuvent en profiter comme d'un guide assuré; et c'est une chose remarquable, que les reverbères déja placées, sont sur presque tous les ponts en Angletèrre, et peut-être en France, aussi plutôt un objet d'embellisement que d'utilité. Les bateaux† à vapeur passent les voûtes, avec une rapidité, accéllerées de tems en tems par le flux et reflux de la mer, ce qui empêche les

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* Les Batiments qui portoient la malle aux lettres ont peri en differente circonstances dans le detroit, on suppose que cette lettre a subi le meme sort.

† La premiere bateau-a-vapeur construit en fer, fut etabli sur la riviere de la Seine en 1824, ce qui faisait de la ville de Paris un port de mer.

marchands de confier leur marchandises, aux bateaux à vapeur. Voyant, que leur sécurité depénd principalement de l'intelligence du Timonier, en perçant les difficultés déjá nommées; en conséquence, il arrive souvent des accidents momentanés qui causent du retard, et qui sont les suites d'une vélocité subitement arrêtées, ce qui se conçoit facilement, ainsi que les endomagemens que l'edifice réçoit par les vibrations et par la ré-action de l'eau contre les pilotis, ou pieux, qui forment leur construction. L'effet de ces chocs réitérés a été trop evident, en voyant le déplacement de la superstructure du vieux Pont de Londres; les fentes ou crevasses qui parâissent àu premier coup-d'œil, furent causés, je conçois par les grands bateaux, chargés de charbon dé terre, qui se heurtent souvent de travers contre les arc-boutants pendant les hautes marés. La raison en est evidente, il s'en suit que l'idée que me frappa le soir du cinq de ce mois, à bord d'un Bateau-à-vapeur, sur la Tamise, démontre la verité du dessein que j'ai l'avantage d'offrir avec soumission aux autorités, à que j'ai l'honneur d'en faire part, par l'entremise de son Excellence le Duc de Richmond et d'Aubigny, et par l'Ambassade Britannique à Paris. En tous cas Messieurs, si mes observations ne meritoient pas votre approbation, je vous prie d'agréer mes homages trés respectueux et de me pardonner d'avoir osè distraire vos précieux momens, consacrés aux affaires publiques, considérant que le but que je me suis proposé, tendoit à l'utilité publique.

J'ai l'honneur d'etre, avec la plus haute consideration,
Messieurs, votre tres obeisant,
CHARLES HENRY ACKERLEY.

P. S.—Depuis que j'ai reçu la réponse du corps municipal de Londres, à ma lettre du neuf de ce mois, cette idée thêorique m'est

survenue. On pourrait placer une lumière au centre de l'arche navigable d'un pont, de manière à faire voir, par l'action de l'eau au flux, et reflux, lés trois périodes de la haute marée, à demie et la marée basse, au moyen du réverbère, et de trois différentes couleurs, attachée à une verge perpendiculaire, à l'arc-boutant, et à l'abri de l'action ondoyante de l'eau: cette verge, serait creusé, hermètiquement fermée, pour agir contre sa gravité spécifique de toute sa longueur, jusqu' à la ligne horizontale à l'orifice du conduit du gaz, ce qui pourrait communiquer en trois places de la verge, d'une manière *spirale*, une action circulaire au centre; par conséquence, démonstratif aux vaisseaux en pleine mer; cequi sera facile au génie dés François.*

* Ce projet d'une utilité generale est respecteusement dédiée au dernier descendant, d'une ligne directe d'une ancienne famille Française tres distinguée née Chamberlayne de Maugersbury, la mére de l'auteur.

[*Notes in reference to page* xix.]

Ocean, 1808.

[*a*] 'Tis true I had not a fever, or a dispepsia. Do you know what dyspepsy is? I will tell you. It is the disease of officers who have grown tired, and then they get invalided for dispepsy.—*Collingwood.*

[*b*] Modon is celebrated as having been the Algiers of the Mediterranean, when in possession of the Knights of Malta.—*Vide Gibbon, et l'Abbe Vertot.*

From the audienza of Ibrahim Pacha on this occasion, the most animated and picturesque scenery presented itself. On the right, in the foreground, lay the encampment of the Egyptian army, *since so redoubtable;* in the distance the Isle of Sphacteria and the Messenian mountains; at their feet, the Bay of Navarin, or ancient Pylos; to the extreme left below, the town of Modon; in front, "the open sea," where the allied fleets, consisting of 40 sail, were manœuvering, under the flag of Capo d'Istrias, in the *Ocean.*

[*c*] De Rigny, Heiden, Campbell, Parker, with the Chargé d'Affaires of Austria and Russia. The latter personage (Kattercazy) was mistaken by both Ibrahim and his generals for Capo d'Istrias: and the Conference was rather disturbed, by certain signals of glances and claps of the Pacha's hands, which were supposed to be the Turkish sign for getting a sack ready.

The Dutch Admiral, Wolterbeck, was at Mahon.—*Vide* Littera, D. No. 50, La Haye, 1828. "La Roi m' autorisé de vous temoigner sa satisfaction, &c. Le Ministre de la Marine et Colonies, *Elout.* Et Archi. Legat. Brit. Rio Janeiro, Brazil, "Pacificacaõ dos Portuguezes,"* (per gratiam Stuart de Rothsey) Sept. 1825; L.S. per "Dom Pedro, Imperador," (sine "*Primeiro.*") Etiam, Records Admiralty Office, Lond; et Transactions Soc. Arts, vol. xlvi p. 33. Etiam, General Orders, Jersey, 1826, Cart. Consul. Brit. Alexandria, Aug. et Nov. 1828. "A few days after your departure, I took an opportunity to deliver to H H. the Viceroy, your letter, with the Roy.-Humane-Soc. Report, No 54. "His Highness desired me to give him a translation of your letter."—*J. Barker.*

Auch werden verschiedene Fàmilien in den Preussischen Rhein Provinzen nicht ungern erfahren, dass der Verfasser dieses Buchleins, derselbe Engländer ist, welcher sich bei einem ernsthaften Ereignisse auf dem Rheine, auf dem Dampfschiffe Concordia, als Reisender befand: Ereigniss, wovon die Köllnische Zeitung in einer ihrer Nummer von August, 1830, Erwahnung machte.

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* The author was especially charged with this historical document of peace in its conveyance, during three days, from the Brazilian capital to the *Spartiate*, 74, at sea off Rio. The mere circumstance has nothing peculiar in it, as a point of service, were it not allowed that destiny has some influence on the ways of men. Why should accident have made him the bearer of the olive branch of the British Nation through the Danish metropolis in 1814, in the procession of Mr. Foster into Copenhagen, as Envoy extraordinary? and at Alexandria, as the humble intermediate of the Greeks in 1828?

(*d*) Lord Yarborough, in his frigate *Falcon*, with dispatches.

(*e*) Caftan-näaci, the bearer of a cloak, or protection from wrath.

(*f*) " M. Boghaz—related to most all of the Dragomen of the Levant, (and to the author's particular friend " Arbro,") was the personage saved by the Austrian Consul at Cairo, when ordered to be thrown in a bag into the Nile. The following day dispatches arrived from Ibrahim, then on the 'Whäabee War,' which nobody could translate—the Consul reproduced Boghaz: his pardon, and subsequent promotion to Prime Minister, was the result of the interpretation of the victory of Ibrahim."

The name of " Arbro" is as celebrated in the Levant as "Vanlennep."

(*g*) Sir Edward Codrington had his Flag in H.M.S. *Asia*.

(*h*) The Pacha of Egypt prides himself on his origin. " Mahomet Ali, s'adonner au trafic des tabacs un des produits les plus lucratifs du territoire de Romelia, (ancient Macedon,) et ce fut la sans doute qu'il prit les premiére notions du commerce, qu'il a toujours conservés."

☞ Admiral Sir Graham Hammond, Bart. conveyed the " Pacificacaõ dos Portuguezes" in the *Spartiate*, 74, to Lisbon; she was known to leak one inch per hour on his giving up the *Wellesley*. A few days after leaving Rio Janeiro, on the very morning of encountering the trade-wind—which cut off all idea of return to Brazil—she sprung a leak, that increased gradually to two feet; the point where the water entered, baffled the most minute research. Such situations call forth the energies and strength of mind of the sailor. The chain pumps were first resorted to, every two hours; but the worthy Admiral discovered, that the interval between pumping gave occasion for reflection. Situated at a distance of two thousand miles from the nearest port, with a fair wind, a more rigid discipline was observed in carrying into effect all the precautions in such trying situations, by giving constant occupation to the crew. It was therefore deemed necessary to proportion to each man in the ship, during his watch, the allotted period of ten minutes, (or forty-five minutes during the twenty-four hours) to the hand-pump; the motion of which continued for three months, until the ship was paid off at Portsmouth. The friction occasioned a renewal of the pump-bolts by the ship's armourer one hundred times, and the oscillating sound of the " clanking brake" remained in the ears of the ship's company for months after they had ceased to belong to her. On being taken into dock, the leak was discovered to be in the centre of the ship's bottom, exactly where she had rested on the chock, in Chatham yard, the space never having been caulked.

LINES OF INCIDENCE

Made by the Current on the last Ebb-set.

From a personal Survey on the 10th to the 16th of March, 1834, between VAUXHALL and NEW LONDON BRIDGE, as indicative of the deepest (channel) water for laden barges, agreeable to the latest plan.—*Vide Map of London.*

VAUXHALL BRIDGE.

Lies N.W.$\frac{1}{2}$W. and S.E.$\frac{1}{2}$E. Rise of Spring-tide, 16ft.

Depth of water on the Surry-side, at low-ebb { 3rd arch, 6ft. / 4th arch, 6ft. 9in.

1st *Line of Incidence*—from 4th arch of Vauxhall, N.E. by N. to Shingled Beach, off Jones's Wharf, 6ft. to 8ft.

2nd—From Jones's Wharf, N.byW. to the South-end of Milbank Row, 7ft. to 8ft.

3rd—Milbank, N.E. to within soundings of 4ft. off Lambeth Stairs, 7ft. to 8ft.

4th—*Lambeth Stairs, to S.W. angle of the *Parliament Bank* in the centre of the river, off the South-end of the House of Lords, N. 8ft. 7ft. 6ft.

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* Within these points, Lambeth (where the four men were lost, in 1833,) and King's Arms Stairs, are the "Roads," where tiers of barges now occupy the greater part of the channel of the tide-current down the Surry-side of the river for one mile and a half.

It is a singular fact, that from off *Lambeth Hard*, the set of the tide takes almost in a straight line at low ebb, down the Surry shore, through the 4th arch of Westminster Bridge before it makes an angle off the *King's Arms Stairs*, having a breadth of channel 200 feet wide, with sounding from 7 to 10 feet, at $\frac{1}{4}$ ebb. Within this distance are tiers of barges, from 14ft. to 16ft. beam, and in length 90ft; four are sometimes fixed abreast, thus filling a space in the tide-way of 85 ft.; and when tailing athwart, in south-easterly winds, occupies the greater part of the channel within the space named, termed "roads." Frequent statements have been made to the Corporation relative to this serious obstruction

5th—From the S.E. angle† of the Bank, N.N.E. to the fourth arch of Westminster Bridge, 7ft. to 8ft.

WESTMINSTER BRIDGE.

Lies East and West. Spring-tide, 16ft. 6in.

Depth of water on the Surry-side, at low-ebb { 3rd arch, 7ft. 6in. / 4th arch, 8ft.

6th—From the 4th arch, N. by E. to the turn of the current, 4ft. 6in. off King's-Arms-Stairs; thrown Eastward by the Regent's, St. James's, and Scotland Yard Sewers, 8ft. 9ft. 10ft.

7th—King's Arms Stairs, N.N.E. to the curve of the current off Belvi Dock, 8ft. to 9ft. 6in.

8th—From the point of curve in 3ft. water off Belvi Dock, N. by W. to West-end of *Waterloo Bank*, on which is 3ft. 10in. in the centre of the river, 6ft. 7ft. 6ft.‡

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of the navigation which brings a revenue to the city of £5 or £6 sterling per annum on the letting of each roadstead, the whole estimated at £800 or £1000 a year. The author conceives, that these moorings ought to be placed out of the tide-way;—these nuisances exist throughout the deep channel of the Thames. In consequence of their being so placed, boats with passengers often get, in dark nights, athwart-hause of these tiers, and then upset.

In the charter of King Richard, in the eighth year of his Reign, it is observable, that the citizens of London are empowered to remove all weirs out of the river Thames, by which nuisances, the navigation of this incomparable river was greatly obstructed; and as a farther encouragement to the citizens, the King resigned (for "fifteen hundred marks," *vide* Mad. Hist. Exch. A.D. 1179,) all his rights and pretensions to the annual duties arising thereby, which were paid to the officers of his Tower of London — *Vide Maitland, p.* 39.

† A buoy placed at this point moored with two fathoms of buoy rope to the south of this (*Parliament*) Shoal, would, at low water, indicate the head of the Bank; the current from this point and Lambeth Stairs, indicates a set to the centre arch of Westminster Bridge, the foundation of which is considered dangerous. This bank might be made serviceable as a breakwater, at this time of tide, and in no way interfering with the navigation.

‡ A buoy, with a buoy rope of three fathoms, moored S.S.W. of Waterloo Shoal, at low water, would shew the head of this bank.

9th—West-end of *Waterloo Bank*, off the Savoy, N.N.E. to 2nd arch of Waterloo Bridge, 5ft. 6ft. 6ft.

WATERLOO BRIDGE.

Lies N.N.W. and S.S.E. Spring-tides, 17ft.

Depth of water on Middlesex-side, low ebb { 1st arch, 6ft. / 2nd arch. 7ft. 5in.

10th—Waterloo Bridge, 2nd arch, E. by N. to the Shingle Beach of Temple Garden Stairs, 6ft. 7ft. 9ft.

11th—Temple Stairs, E. ½N. to Pig's Quay, 6ft. 7ft. 6ft.

12th—From the curve off Pig's Quay, S.E. by E. to the 4th arch of Blackfriars, 6ft. 7ft. 6ft.

BLACKFRIARS BRIDGE.

Lies N. ½E. and S. ½W. Spring-tides, 17ft. 4in.

Depth of water on the Surry-side, at low ebb, 4th arch, 7ft.

13—Blackfriars, 4th arch, E. ½S. to centre arch of Southwark, 8ft. to 10ft.

SOUTHWARK BRIDGE.*

Lies N.N.E. and S.S.W. Spring-tide, 20ft.

14th—From Southwark centre arch, E. by N. to the curve of tide, 4ft. 6in. off Dowgate Sewer, 10ft. 9ft. 7ft.

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* It must be understood, that the navigation of the River Thames from Vauxhall Bridge down, continues to the *last ebb-set*. West-country barges deeply laden, bound below London Bridge, haul into slack water, *South*, when through Southwark Bridge, and are obliged to remain sometimes two hours in Easterly winds, fearing to pass the rapids of *St. Saviour's* Shoal, *where* a buoy moored in three fathoms West, (*guyed*) would, at low water, indicate the head of this dangerous shoal lying in the centre, above London Bridge. The same is required to the bank in the centre of the river below London Bridge, off Billingsgate, having thereon only one foot water.

Are there any shoals on the south-side, near the bridge, which you think contribute to the occasion of such losses?—There is a shoal on the upper side of the bridge. What do you mean by the upper side?—The west-side, where I have got aground.—[*Vide* Evid. Sam. Pegge, Select Com. House Commons, June 21, 1820]

15th—Dowgate Sewer, S.S.E. ½E. to the curve in 4ft. off Shadbolt's Store, 6ft. 7ft. 6ft.

16th—Shadbolt's Store, E. ½S. to Moat's Wharf, 6ft. 6ft. 6ft.

17th—Moat's Wharf, N.E. ½E. to North-west angle of *St. Saviour's Bank* (depth, 8in. to 10in. in the centre of the river, in a line with the middle arch of London Bridge to the Old Swan Stairs, 7ft. 8ft. 9ft.

18th—Swan Stairs, E.by S. through the first arch, Middlesex-side of London Bridge, 6ft. 7ft. 9½ft.

LONDON BRIDGE.*

Lies N. by E. and S. by W. Spring-tide, 20ft.

"The fall of water in the Thames from Oxford to Maidenhead, is about 25ft. every 10 miles; from Maidenhead to Chertsey Bridge, 22ft. every 10 miles; from Chertsey Bridge to Mortlake, 16ft. every 10 miles; and from Mortlake to London, about 1ft. per mile. Afterwards, the fall diminishes more gradually till the river unites with the sea; from whence the influence of the flow of tide is experienced above its ancient limits, Tide-end-town,† a distance of 84 miles, but navigable for vessels of 90 tons, 130 miles."

While afloat, correcting the proof of the above details, on the 16th March, at 1, p.m. our industry was rewarded by ocular demonstration, by an occurrence as represented in p. 7, line 10, of the "Observations." The barge-master perceiving his dilemma, became as sensible to his danger, as the poor animal manifested before the jaws of the Boa Constrictor, as witnessed on board the

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* London Bridge. This survey was taken during the last ebb quarter of the river navigation. Laden vessels bound upwards, take exactly the lines of incidence; passing through the same navigable arches as on the ebb-tide.—Each of the buoys placed on the shoals, require a "flood set guy."

† Teddington.

ship that conveyed Lord Amherst from China. The vessel, about 60 tons, received the sliding blow against the buttress of Blackfriars Bridge, on her larboard quarter; and being deep, with a top cargo, she heeled two streaks, or about 15 degrees to port, evincing a visible strain throughout her fabric. The impression on the mind of the observer at the moment of collision, was the adaptation of spirals, to be used as fenders covered with the usual matting, whose contracting power would counteract the cause with the same facility of effect as the loco-motive vehicles experience on sudden stoppage. This *offspring*, resulting from the Author's observations on the Thames, is the foundation of a theory, which he conceives of the utmost importance to the shipping interest in general.—*Vide Addenda.*

" *What do you mean by the expression, loss upon each barge?* From the blows and rubs that they receive from the Bridge. * *

" *The craft receive some injury from that circumstance?*—Very serious injury from that circumstance, because every nail and timber must be shaken; she is not supported by the water at all; this check shakes the whole mass of the barge in general, and is particularly injurious to old craft; indeed no old craft ought ever to go through under those circumstances."—[*Vide* " Evid. of Mr. C. Green, 27 June, 1820, before Select Com. of the House of Com."]

The Author of this small work now concludes. He has used his utmost endeavours not only to delineate the truth, but to lighten throughout a subject which, from the dryness of its nature, might have failed to engage the attention of those, who may now honor his production with their perusal.

END OF APPENDIX.

ADDENDA.

"It is not rhetoric, but reason, can satisfy the judgment: the former may cozen the conscience, and dazzle simple men; the latter, only can satisfy the mind, and lead to truth."---MILTON.

☞ The Author devotes this page to the declaration of his thanks to Messrs. HOLDSWORTH & BALL (proprietors of the "Guide to Knowledge") for introducing into their New Map of London for 1834, many Improvements suggested by his assiduous Survey on the River Thames.

ADDENDA.

A theoretical Essay on the Mechanical Adaptation of the SPIRAL, *when combined with Naval Architecture.*

——"In *spiral* motion first, as seamen deem,
Swells, when the raging whirlwind sweeps the stream."

THE "ultima" to be arrived at in Naval science, connected with the internal architectural arrangements of a ship, is the *force* of putting a quiescent body in action, and thereby communicate to its non-elastic contents, a participation of the oscillative movement which all floating and vibratory particles ought to partake of, when acted on by the undulations of the sea, in harmony with the fabric, and in conjunction with the *active force;* tending to extend the progressive properties of a vessel's rapidity through the water.*

In mechanics, the quality of a solid, if it moves, must move altogether, and can only produce a pressure downwards, which will be equivalent to its weight or gravitating force; as it is quite evident that the same force, which would give motion to a body *at rest*,† would, if applied in the proper direction to a body in motion, increase the *quantity of motion;* and if contrariwise, diminish it, producing what is denominated in Science *passive* or *resisting forces*. Sir Isaac Newton defines true or absolute rest, to be the continuance of a body in the same part of absolute

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* And by Minerva's aid *a fabric* rear'd.—*Dryden.*

The proportion of the non-elastic contents of an 18-gun brig of 382 tons, bear to the elastic, are 218 tons to 24, as external pliability. In a 26-gun corvette of 944 tons, 516 to 65 tons, including masts, yards, sails, rigging, &c. —*Edye.*

† Rest—the continuance of a body in the same place, or its continual application or contiguity to the same parts of the ambient or contiguous bodies, and therefore is opposed to motion.

"It is one of the laws of nature, that matter is indifferent to motion or rest."—*Burney.*

"The resistance which a body resting upon another offers to a force tending to put it in motion, is greater than the friction of the same body when moving on the other."—*Coulcomb.*

The resistance which a projectile suffers in its passage through the air, and a solid body in progress descending through water, are familiar examples.

space; and relative rest, to be the continuance of a body in the same part of relative space. Thus, in a ship under sail, relative rest is the continuance of a body in the same part of the ship; but absolute rest is its continuance in the same part of universal space in which the ship itself is contained.

It may be true, (says an intelligent mechanician, on *passive*, or *resisting forces*,) that no motion ever takes place on the surface of the earth without the manifestation of resisting forces: as the resistence which fluids, both elastic, and non-elastic, oppose to the motion of bodies through them, are, perhaps, the most common and striking examples of these forces. Hence it follows, from conclusions drawn from mechanical, as well as our own analytical reasoning, aided by the fundamental truth, "common sense," that if action and re-action can be communicated to the whole fabric of the interior of the ship, (acting as they do in opposite directions) such a principle, we humbly conceive, is embraced in the adaptation of the Archimedean Spiral action, now proposed for the consideration of the scientific.*

The author naturally feels a delicacy on instituting a new theory, without the requisite of strong reasoning, to be acquired

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* Why should they in chase, or retreat,—as we did in the *Sheldrake*‖ against the Danish gun-boats, and afterwards in the *Daphne*,§ during the siege of Dantzic, sustained by "Rapp."¶—take the wedges from the masts—hang shot boxes to the stays—centralize the dead weight—ease the lanyards of the rigging—send the crew to their hammocks—and, as the *dernier ressort* of the undaunted American, "cut his bulwarks to the water's edge,"—were it not to obtain similar results, by giving elasticity to the frame of the floating medium?

Why should the "stretchers" in the swiftest gallies be made of the most elastic wood? or, that the steerer in a pulling match should, like a pendulum, respond to the physical impetus of the rowers?

The vertebræ of our backs respond, as the "Galégo's" do to the balance that sustains the bales of cotton of some hundred pounds weight.

‖ The *Sheldrake*, Capt Thicknesse, regarded as one of the most vigilant cruisers of the Baltic fleet, under (Lord) de Saumarez, and considered so under her subsequent commander, Stewart.

§ The *Daphne*, Captain J. Green, commanded before Dantzic, and afterwards conveyed His Excellency, S. Foster, to Copenhagen.

¶ The brave General Rapp, against a Russian army under le Prince de Winzingrode, and a detachment of British royal artillery with Congreve rockets, whose destructive explosions, from *their different stations*, gave a brilliancy to the night scenery, similar to the corruscations of the aurora-borealis.

THE ADAPTATION OF THE ARCHIMEDIAN SPIRAL TO NAUTICAL PURPOSES.

Fig. 1.

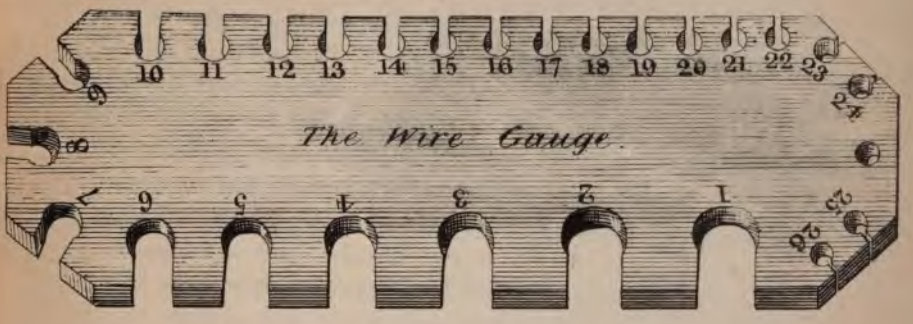


Fig. 3.

Diameter 1¾ In.

N.º 8.

Fig. 7

Length 3 in.

e

Fig. 5.

a

Fig. 6.

d *b* *c*

Fig. 2.

a

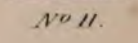
Diameter 5½ In.

N.º 2

a *Fig. 8.*

Fig. 1.

Diameter 2⅔ In.



N.º 11.

DEDICATED WITH PERMISSION OF H.R.H. THE DUCHESS OF KENT
TO THE PRINCESS VICTORIA
By C. H. ACKERLEY Esq.r Lieutenant in the Royal Navy. 1834.

only through the ground-work of early erudition, but he is upheld in his researches by comparing the knowledge of the most ancient writers on architectural science, with the improvements of the most modern, both of whom plainly indicate, that not only the writer's own profession,* but almost all the sciences may be considerably simplified by a strict attention to the basement of their superstructure; and "when important truth is in question, undeserved and idle compliment is criminal to the world." The march of human improvement—in the words of a shrewd writer in the Quarterly Review, vol. xxxiv.—is first to practise an art imperfectly perhaps, and merely in relation to our feeble wants; then comes an observer, who examines the instruments; a spectator, who inquires into the causes; a philosopher, who explains the general principles. But, the acme of civilization in this art, (at least the world has hitherto seen no higher) is when its instruments, causes, and principles, after undergoing the ordeal of of philosophy, reach upon its *practice*, and make that philosophical.

The multifarious results, both "by sea and land,"† to be derived from the adoption of this most simple contrivance, creates in the mind of its elucidator a reverential awe, on the presumption of regenerating latent principles, that had their origin in a geometrician, whose dormant fame he ventures to revivify, in a theory erected on practical inspection, towards facilitating the Thames navigation.‡ It may, with truth, be termed its "offspring;" and as such, it is presented, with confiding care, to the "Conservator," and the scientific.

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* "In all professions there are men who fear to advance; who think the world well enough as it is; who, forgetting that it was by a series of progresses that it reached its present condition, would (were it possible) stop it in its course."

† Applicable to vehicles of all descriptions.

‡ "Nous respectons toutes les opinions fondées sur une conviction sincère qui résulte d'un examen approfondi."—

And "never do we perform our duties to our friends better than when we remember, that posterity may, in all probability, reap the fruits of our efforts."—*King of Sweden's Speech to his Parliament*, 1834.

EXPLANATION OF THE SPIRAL,

AND ITS ADAPTATION TO NAUTICAL PURPOSES.

"---When o'er the ship, in undulation vast,
A giant surge down rushes from on high,
And fore and aft DISSEVER'D ruins lie."---FALCONER.

Fig. 1,—The wire gauge in general use.

Fig. 2,—A double conic spiral, whose size of wire is No. 2, in *fig.* 1, five inches and a half in diameter—possessing the properties of elasticity, when regulated by the adjusting chain, *a*. It resists great pressure, and capable of oscillating under seventy-eight pounds, weighing two pounds eight ounces avoirdupois; powerful, when highly tempered, in counteracting the rotary motion of the lower mast of ships, when placed within the partners to relieve the upper decks from pressure, in the place of the *inelastic wedge;**—as a *rest* or bed for chronometers, consequently rendering them less likely to be effected by the firing of the ship's artillery, or convulsive straining in heavy gales of wind.—[*Vide* Owen's Narrative, pages 8 & 9, on chronometers.]

Figs. 3 & 4,—Indicate the relative proportions to their specific weight. *Fig.* 3, oscillates under thirty pounds, and weighs *nine ounces;* and *fig.* 4, under seventeen, and weighs *one ounce and a half.*

Fig. 5,—A boat's fender covered with leather; containing, by way of exemplification, a spiral, *a*, of No. 11, in the wire gauge.

Fig. 6,—An arrangement of twelve spirals of No. 2 wire, confined in their positions by a metallic rod, *b*, linked at the corners,

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* In a *lurch* (of H.M. brig *Apelles*, while "trying" in a gale of wind off the Nase of Norway,) the seams of the upper-deck opened sufficient to admit the *lead* line, doubtless, from the wedging of the masts. Similar effects were experienced by H.M. ship *Ocean*, during her passage from Lisbon in 1826, whilst labouring broadside-on to a *mountainous* sea; on which occasion, the angle made by the masts in her *lurches*, were estimated at forty degrees, rendering her decks like a sieve.

"For, while intent the yawning decks to ease,
Fill'd ever and anon with rushing seas."

and passing round their centres, the mass suspended by the hand;—possessing compound properties, on the adjustment of each spiral by the chain, *fig.* 2, *a*, of resisting a concussion of three quarters of a ton weight;—proposed, when covered with thrumb-spun yarn-matting, *d*, as a fender, in lieu of the non-elastic one in use, to counteract any sudden straining merchant-ships, vessels, barges, and canal boats may receive, when lying in tiers; or in cases of emergency, for the protection of boats, launches, &c. alongside of ships in heavy weather; applicable between beams, either in a lateral, vertical, or horizontal position, *from outer sterlings.*

—*c*, the adjusted thickness of the fender, together with its matting, three inches.

—*d*, the thrumb-spun matting, twenty pounds weight.

—*e*, the length and breadth, three feet by two and a half, weighing sixty pounds.

Fig. 7,—A compound barrelled helix, having contraction and extension under four hundred weight, but whose form does not admit of contracting within itself, weighing one pound and two ounces; deemed applicable to the mast-heads of ships, when fixed and adjusted horizontally below the cap, to relieve the top-mast from sudden jerks or working within the cap, which occasion this denomination of spars snapping off about three feet above the lower mast heads.*

Fig. 8,—The adaptation of the double conic spiral, in conjunction with a compound elliptic spring in resisting great gravitating pressure from top-deck weight, on board of flush-deck vessels when fixed on the top of the "gallows-bits"† that support the boats, booms, &c. estimated at four tons and upwards, and consequently,

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* The dead weight, *non-elastic*, on the masts of a 120-gun ship, as well as in the *Ocean* 80, including the tops, caps, and cross-trees, estimated at 11 tons, 6 cwt. 3 qrs. The top-masts of this class ships have a quarter of an inch rotary play within their *caps*. The distance between the lower mast-head and top-mast (or dead wood of the cap) is nine inches.—[*Vide fig.* 7]

† The non-elastic on the *gallows bits* of a corvette of 944 tons measurement, 11 tons, 7 cwt.,—18 gun brig of 382 tons, 4 tons, 17 cwt.—Length of an 18-gun brig's main-mast is 22 yards, 27 inches; diameter 21, three-eights, weighing 3 tons, 2 cwt. 2 qrs.; driver-boom 19 yards, 12 inches; diameter 13½, weighing 19 cwt. 9 pounds, demonstrating the necessity of an elastic crutch to the latter, not only in relief to the stern frame in heavy gales, but as a preventive against the mast head-bolts drawing, and of that spar *springing* through want of foresight.

causing elasticity to this mass,—applicable when used in giving effect to the non-elastic contents of a ship's cargo, &c. as a fixture, or as a *semi*-elliptic with plates, acting on a *conic spiral*, *a*, across the kelson, poised on sockets from the ship's "ribs" or timbers, either above or underneath *the platform* on which the cargo of a vessel rests. Divesting from *fig.* 8, all above the dotted line, *a*, (*the conic spiral and upper elliptic*) leaves an under "elliptic spring," with seven highly tempered plates, *b*, confined by iron, with central extensive action from its eye-bolt, *c*, acting freely on and between two bolts with nobs or nuts, *e*, fixtures in the deck at *f*, creating the power of extension to many tons; to which it is proposed, the lower mast-stays and swifters of line-of-battle ships should be "set up" to;—adaptable when fitted in a lesser degree in the top-gallant mast cross-trees, thereby rendering less likely, the *springing* of spars, stays, or the *bellying* of the masts;—the former is prevented in part by immediate recourse in heavy gales to ponderous tackles, termed "runners;" the latter, proceeding from the same cause and effect, obviated in part by what are termed "belly-stays," but all proceeding, in consequence of the masts not corresponding in unison with the oscillative motion of a floating body when in conjunction with the undulations of the sea.*

[Argument in reference to Appendix, page xi, line 27, and Addenda, p. vii. line xxii.]

In these pages, allusions are made to counteract the effects of "vertical vibration" on the action of the helm in the pitch or plunge of the fore part of a ship into the water, which the French term "lof à la risée," by putting the helm hard-a-lee. The reason (says Burney) usually given for this practice is, that the sudden movement of the helm prevents the ship's head from falling with

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* Main-mast of a 120 gun ship of 2,602 tons; length 123 ft.; diameter 40 inches, weighing 20 tons, 2 cwt 3 qrs. Length from the partners where this spar is wedged on the main-deck, 93 ft., projecting above the upper-deck 83 ft. Within the ship housed, 40 ft.—*Vide Note* on the application of *fig.* 8, as an horizontal stay, in lieu of the wedge, and the oval instead of the circular form at the partners.

so much weight and rapidity into the hollow of the sea, as it would otherwise, which is presuming that the slow and uncertain effect of the helm is sufficient to retard the certain and violent action of gravity, a position that necessarily infers a very singular *theory of mechanics*. We shall not endeavour to advance any argument in favour of this practice, (says the above author,) but only remark, that it is most strictly observed, both in merchant ships and in His Majesty's service.

The conclusions to be drawn from the above reasoning, admits of the following inference.

The orifice for admitting the mast through the deck of a ship to its rest, or "step," on the kelson, is of a circular form, termed in naval architecture, "partners," or frame-work, as preventives from pressure to the decks. The form of this aperture we consider, from practical observation, should be an *oval*, and consequently allow, on the principle of mechanics, greater freedom in its cavity, should the momentum exceed the repulsion, conformable with the laws of Science, which experience daily points out when encountering a head sea.*

The rotary motion which the masts of a three-decker demonstrates at all times at sea from its bulk, (20 tons,) and housing of one-third of its length below deck, that any check suddenly received at the *partners*, is felt midway between the deck and mast-head, and accordingly produces a central bending of the spar, (manifested by preventives) arising from an erroneous system, in having *a conductor in the wedge* to the decks, obviated either by the use of the Spiral, *fig.* 7, or the application of a stay, applied horizontally, below the partners of the upper deck, working in a socket between the

* "It is an axiom in natural philosophy, that every body will persevere in a state of rest, or of moving uniformly in a right line, unless it be compelled to change its state by forces impressed; and that the change of motion is proportional to the moving force impressed and made according to the right line in which that force acts," whether it be produced from sudden stoppage, as a ship taking the ground, or the projectile effect caused by the falling of a horse in a cabriolet — which in the latter example, *experience* has developed the use of a breast-strap. — *Verbum sat.*

mast-beams; and fore and aft *carlins*, conveyed to the imagination under the dotted line of *fig.* 8, *c.*

> " The sides convulsive shook on groaning BEAMS,
> And, rent with labour, yawn'd their pitchy seams."

[Arguments in reference to the Addenda, page vi, line 30.]

The *Ocean*, 80, was labouring in a heavy gale of wind, off Ushant, under a close-reef main-topsail, main and mizen-trysail, with fore-storm stay-sail. On a sudden all the three after sails blew from their clews; she payed off into the trough of the sea, indicating to the eye a spectacle of awful grandeur " ingulfed beneath two fluctuating hills." The first weather-roll, the sea broke in on larboard-waist hammocks; its subsequent, to leeward, wounded four-and-twenty men. Not a man offered to go aloft,—the mast bending like a fly-rod. The brace-less topsail-yard, with its remnants of sail, by working up its mast, maintained the equilibrium, but wanted security. " A nation has been saved by an individual:" His Majesty's ship was from foundering, by the intrepidity of Mr. Robinson, admiralty mate, who exhibited " the firmest front when the greater ills were near;" and in " scaling the breach," set an example in going aloft, that dispelled the panic; as vivid now, on the memory of the author, as it was to the astonishment of the crew, and Field Marshal Lord Beresford.

> " The MAIN-sail, all in streaming ruins tore,
> Loud fluttering, imitates the thunder's roar:
> The ship still labours in th' oppressive strain,
> Low bending, as if ne'er to rise again".

[In allusion to the *Motto* in the Title page.]

After a sedulous investigation into the works of Virgil at the British Museum for this line, (kindly transmitted by a Worcestershire friend,) a perfect stranger was prompted to address the following elucidation thereon, which is inserted in compliment to its author's refined erudition.

You will look in vain for the verse you inquire about in Virgil, or any of the regular classics. It is not there to be found. It is one of those fragments of antiquity, or of the middle ages, which has come down to us, having its author unknown, or uncertain. I recollect having read with attention a conversation on the subject, wherein Dr. Johnson delivered his opinion. Some

literary person of distinction had, I think, offered a reward to discover the author of this very line:

"Incidit in Scyllam, cupiens vitare Charybdim."

Johnson, if I recollect right, named the author, and the poem to which it belongs, but I forget where this conference took place, or where it is recorded. It may be in Boswell's Life of him, or the Gentleman's Magazine. There are several other lines and passages of the same description, amongst which is,

"Tempora mutantur, et nos mutamur in illis."

And another,

"——— semel insanivimus omnes."

In prose too,

"Quem Deus vult perdere prius dementat."

These are all well known and often quoted, but probably upon an unknown authority. In our language too, there are several, generally thought to be in Hudibras, but erroneously so.

[Referring to Observations, page 15.]

"*Wanderings by the Seine*," *by Leitch Ritchie.*

Cartularium S. Georgii de Boscherville, No. 86.—The abbey of St. George was founded by Radulphus or Ravul de Tancarville, major-domo and chamberlain or treasurer to William Duke of Normandy, afterwards King of England. The pedigree of Tancarville (as collected from the Charters recorded in the volume in question) commences with Geraldus de Tancarville, the father to the founder, and is brought down to the year 1275, when Radulphus de Tancarville is styled *Chamberlayn.* He was the great-great-great-grandson of the founder. There are notices of the Tankervilles in the Histoire Genealogique de France, par Père Anselme.

A FAC-SIMILE

Of the SEAL discovered in the

alluded to, Archives of the Hôtel de Soubise, belonging to Jean de Mellun, Compte de Tancarville, 1366.

The first Emanation of the Author's practical reasoning, is here re-published at the request of its commercial admirers.

[Alluded to in the Appendix, page xxiii. line 21.]

"As when enclosing harpooneers assail
In hyperborean seas the slumbering whale;
Soon as their javelins pierce his scaly side,
He groans, he darts impetuous down the tide;
And rack'd all o'er with lacerating pain,
He flies remote beneath the flood in vain."

EXPLANATORY.

Fig. 1,—A stern view of a boat.

Fig. 2,—a side view of the bow of one similar. *a a*, two T-headed square metallic rods, sliding freely in the staples on the stern of the boat. *c c*, forelocks, by which they may be taken out for cleaning. *d d*, the position of two more are within the boat, on her quarters. *e e e e*, are similar rods, placed at her fore-end; the two nearest are raised merely to show them, these slide through metallic plates.

Fig. 3,—The self-acting safety-rod, and two plates, *f* and *g*, separate. The plates, *f*, are screwed on the gunwale, *h*; and the plates, *g*, to the headsheets over the bevelled hole as a fair leader *i*.

Fig. 4,—Represents a boat upset, when all the rods drop down, as shown at *a a*, sufficient for men to stand on, and consequently "to lie bye" on a boat when upset; without which assistance the body could not maintain its equilibrium, as its physical force would become utterly exhausted.

The Metallic Rod in no way interferes with the oars, masts, sails, or stowage; in the headsheets of whale-boats, it is cased in, or placed each side of the stem, on the outside.

"Pictures drawn in our minds are laid in fading colours, and if not sometimes refreshed, vanish and disappear."—*Locke.*

To the *intellect* of the Inventor of Lithography, ("SENNEFELDER,") the author is indebted for his illustrations; he cannot therefore, conscientiously, close this work without devoting the following quotations, in homage to departed genius, the refulgence of which, deserves the same eulogies "while *memory* holds a seat," as were awakened by the encomiums of a distinguished foreigner, in honor of a Briton, the projector of the Steam Engine.

"---Till prostrate time adore his deathless name,
Fix'd on the solid base of ADAMANTINE fame."

"But heaven its GIFTS not all at once bestows,
These years with wisdom crowns, with actions those."---POPE.

FINIS.